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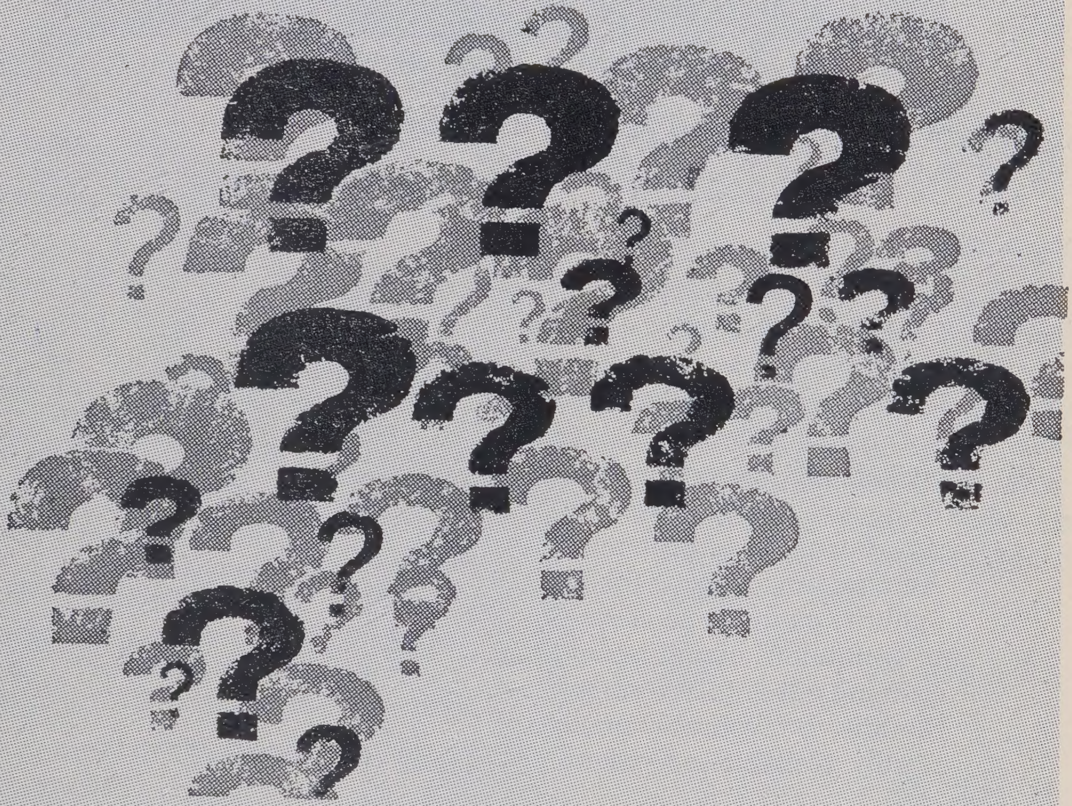

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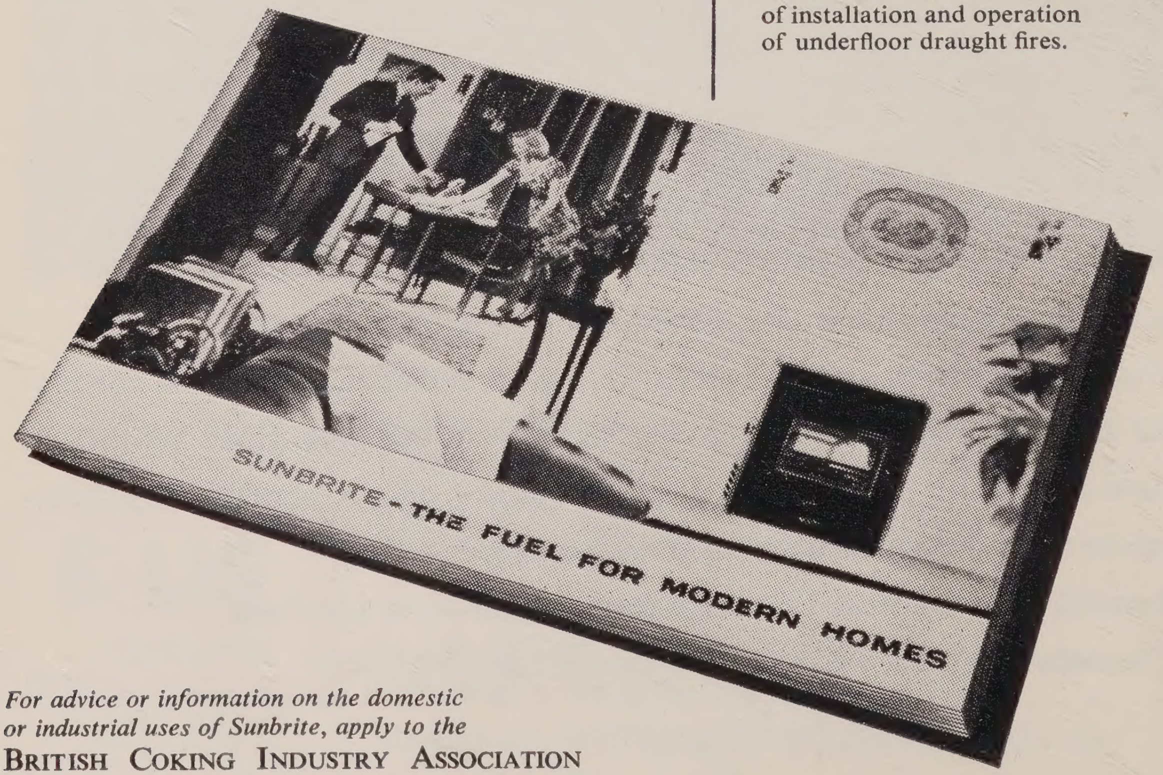

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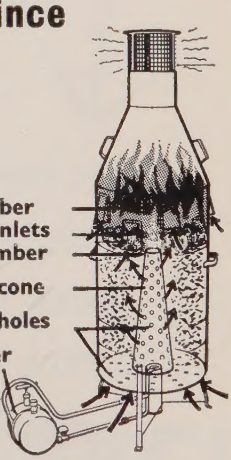

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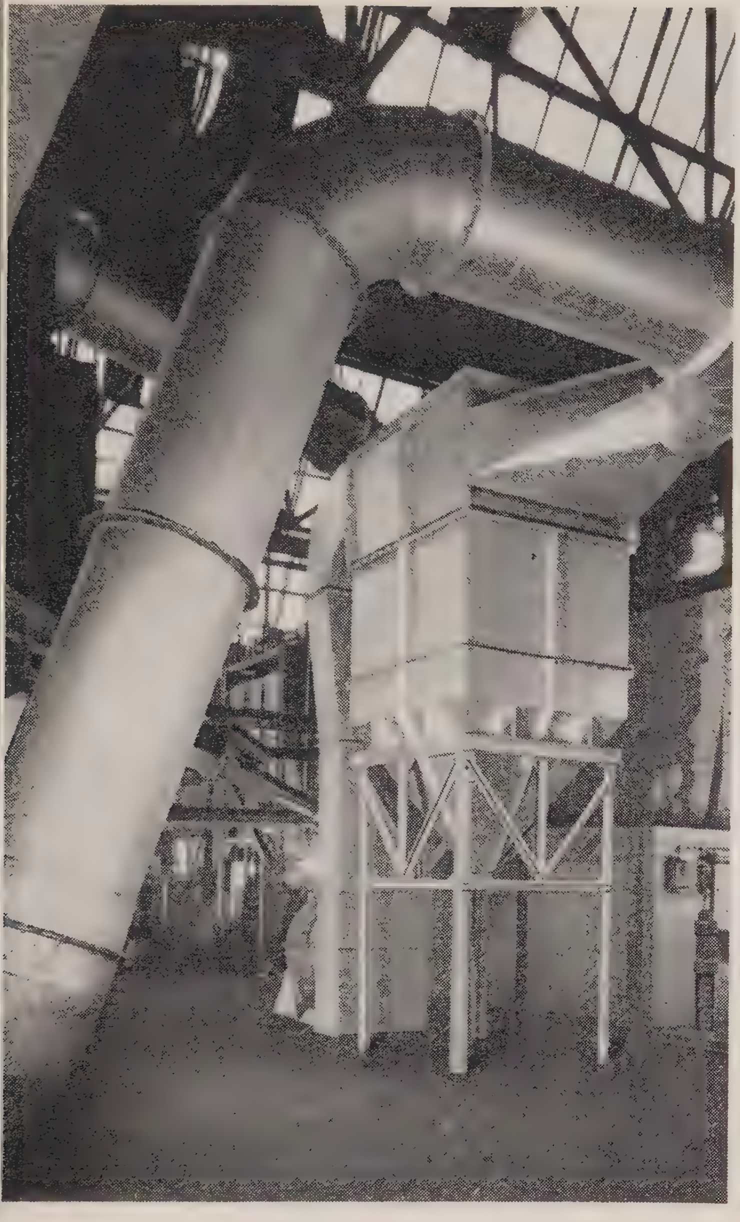

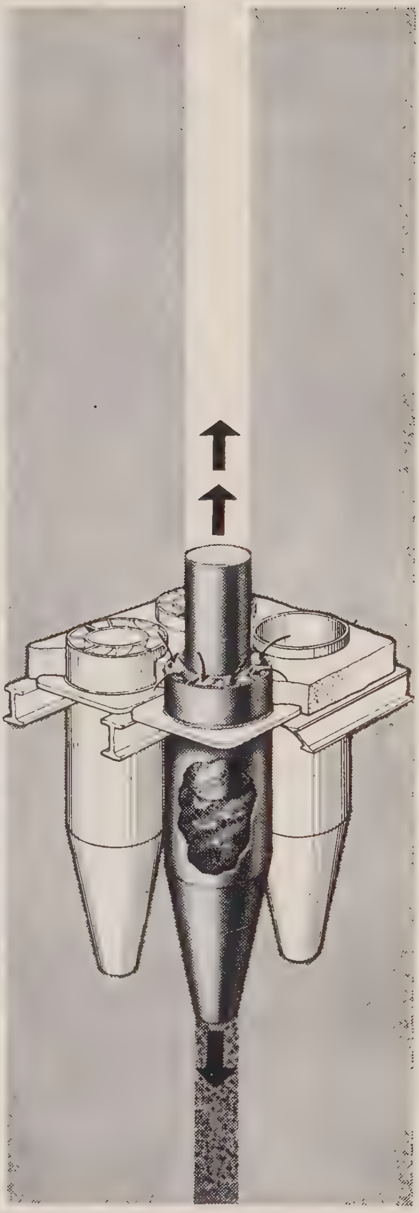

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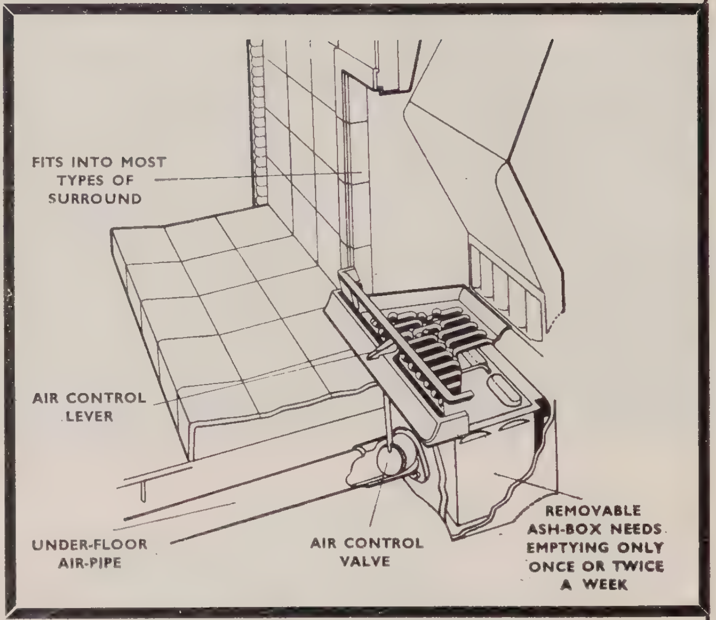
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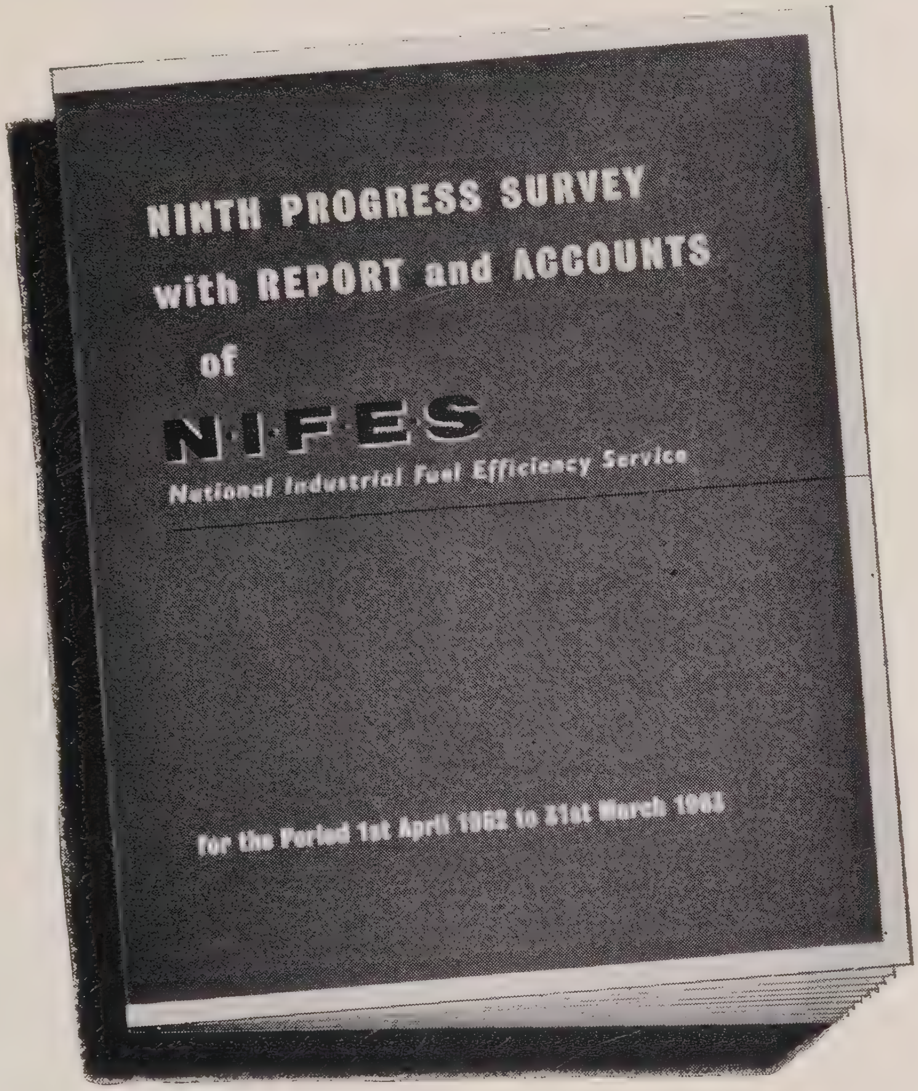
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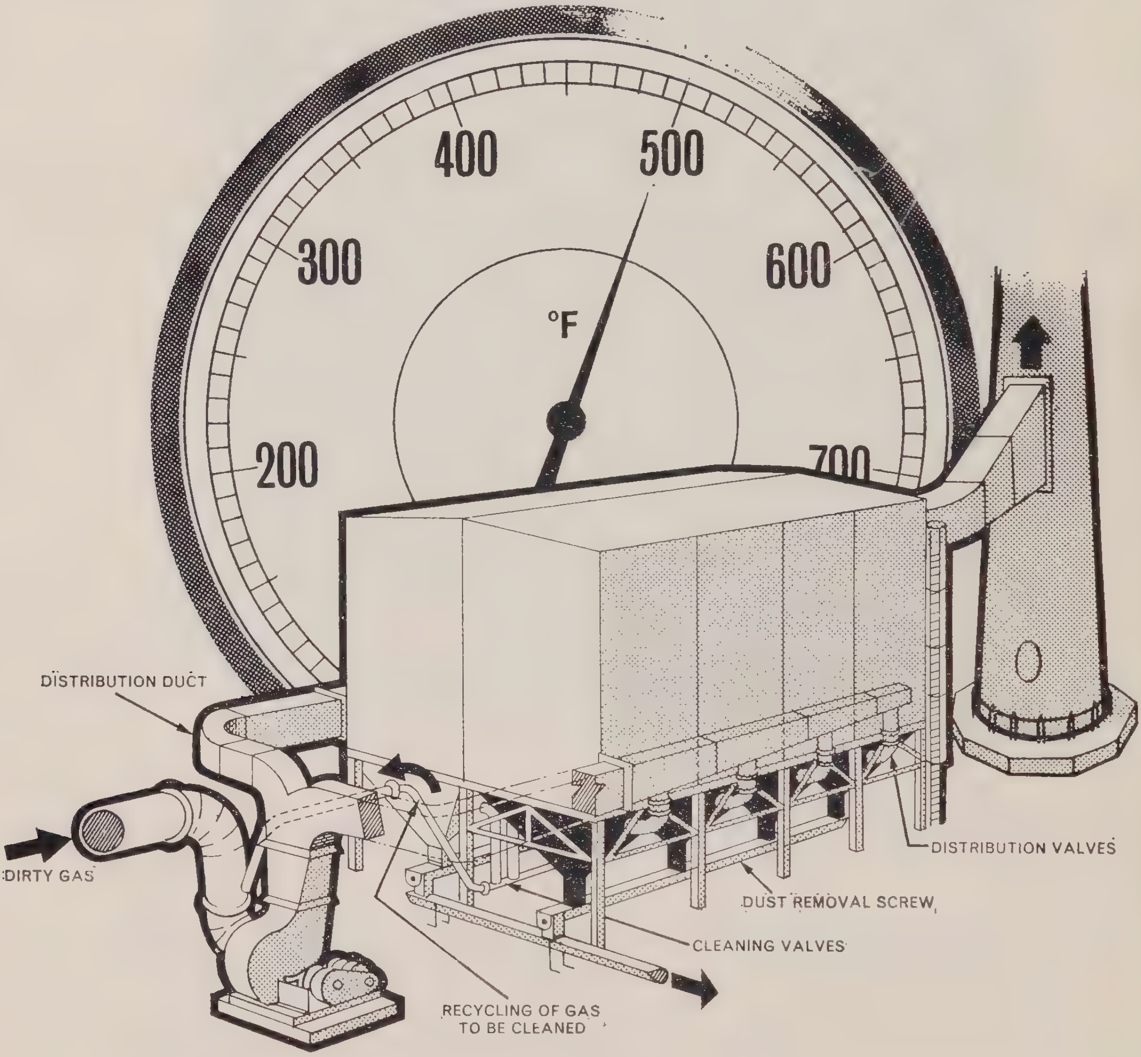

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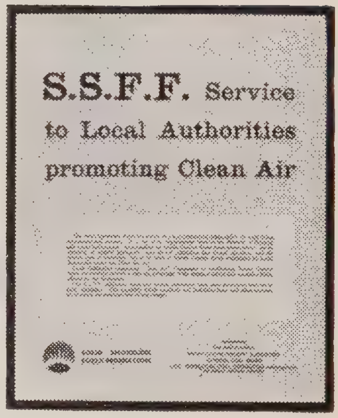
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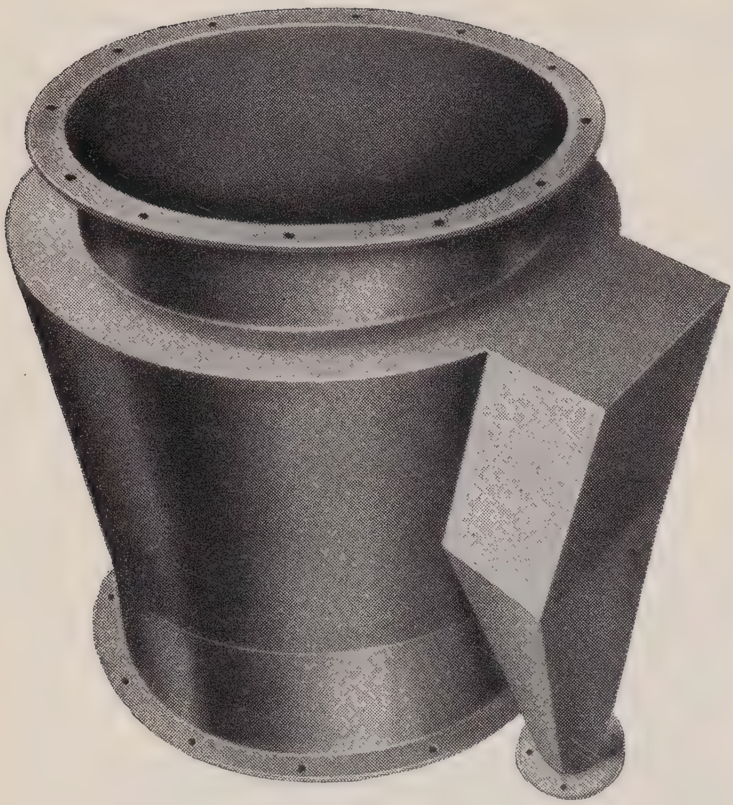

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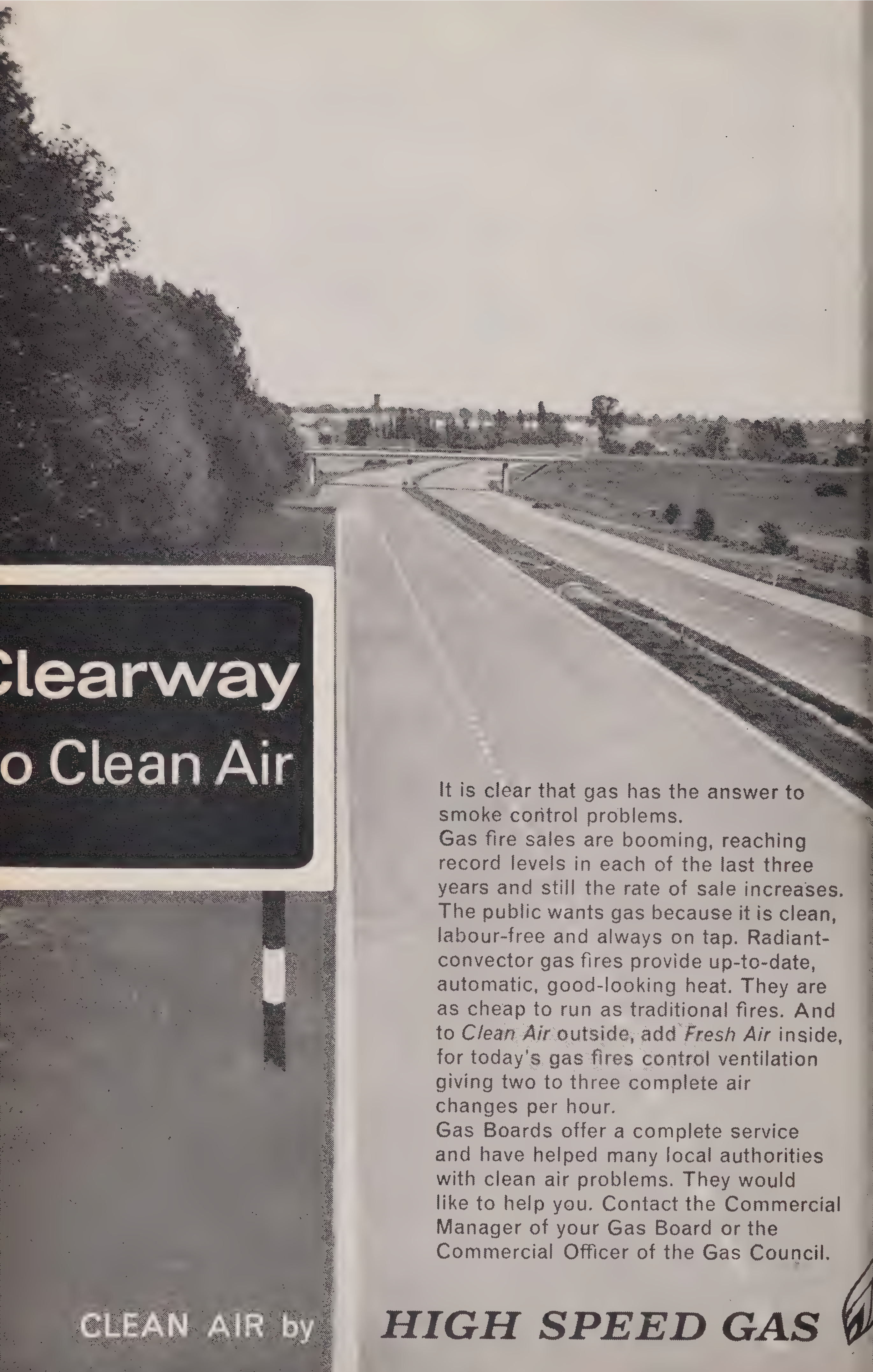

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CLEAN AIR YEAR BOOK
1964—1965

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CLEAN AIR PROGRESS

Review for 1963–4

THE following record consists mainly of a brief summary of some of the more important events in the field of air pollution during the twelve months from May, 1963. All the matters mentioned have been reported more fully in *Smokeless Air*, the NSCA quarterly, and the references in parentheses are to the appropriate issue of that journal, numbers 126 to 129, Summer, 1963 to Spring, 1964.

Smoke Control Areas

The most important changes since the passing of the Clean Air Act, 1956, occurred during the period, as a result of the White Paper on "Domestic Fuel Supplies and Clean Air Policy", and the Ministerial Circulars on the subject. These are summarized on a later page. The main effect is that since open fire smokeless solid fuel will decrease in net supply, because of a diminishing production of gas coke, other solid fuels will have to be used to a greater extent, and for this openable stoves or room heaters, and underfloor draught open fires will have to be installed. Greater use is expected also for gas roomheaters, oil heaters, and off-peak electric storage or underfloor heaters. These changes, although promoting greater efficiency and economy in use, will cost more to install, thus increasing the cost of smoke control for the householder, the local authority, and the Exchequer. Reactions to the changes, though they are likely in the long run to be beneficial to clean air, have varied considerably among local authorities. In some cases the smoke control programmes have been suspended or seriously slowed down, in others they are continuing though at a reduced pace, while in others they are continuing to be implemented as planned. The situation has been fully discussed in recent issues of *Smokeless Air* (127, 128, 129).

The table on another page, showing progress towards smoke control in the different regions, reveals how the Greater London lead is being well maintained.

Northern Ireland

A Bill, following closely the Clean Air Act, 1956 (which applies only to England, Wales and Scotland) has been introduced into the Northern Ireland Parliament and is likely to have been enacted by the time this is published. New clauses relate to powers to make regulations for the control of sulphur dioxide emissions if methods become available, and to the prevention of road vehicle pollution by local authority officers. (*S.A.*, 126)

The Alkali &c. Works Act

The centenary of the passing of the first Alkali Act in 1863 has been observed by the publication of papers and articles reviewing the progress made under the Act. It will also be the subject of a Des Voeux Memorial Lecture by the Chief Alkali Inspector, Dr. J. S. Carter, at the NSCA annual conference at Harrogate in October, 1964. (*S.A.* 126)

Conferences

In addition to the NSCA annual conference and exhibition, which in 1963 was held in Scarborough, air pollution has again been the subject of a number of conferences, lectures, papers and sessions. Special conferences of industrial importance held during the year were one on the control and collection of fumes from steel foundry melting furnaces, organized by the British Steel Castings Research Association at York in April, 1963, (*S.A.*, 127) and one on fume arrestment in steel making processes, organized by the Iron and Steel Institute in London in November, 1963 (*S.A.*, 129)

Surveys

Three inquiries of interest have been reported during the year. The Association of Public Health Inspectors at its annual conference at Eastbourne in September presented a report of a survey it has made, by means of a questionnaire, on smoke control areas. The report revealed the strength of the trend towards the installation of gas and electrical appliances when conversions were made (*S.A.*, 128). An inquiry to local authorities in its area was conducted by the London and Home Counties Advisory Council for Clean Air on smoke control conversion costs. This showed that the actual cost of conversions was proving to be less than one-half the previously estimated costs. (*S.A.*, 129)

The NSCA carried out an inquiry by means of a questionnaire to local authorities on estimated changes in smoke, grit and dust emissions from industrial sources since the passing of the Clean Air Act. The replies showed that smoke was now estimated to have been reduced by about one-half, and grit and dust by about two-fifths. (*S.A.*, 129)

Road Traffic Pollution

The Ministry of Transport spot checks on diesel vehicles for smoke emission have taken place at intervals, and the NSCA Technical Committee have made a further report on the problem, with further proposals to the Ministry. The Road Haulage Association and Traders Road Transport Association have instituted a scheme for the reporting of offending vehicles which should be of value and which is of special interest in coming from an important sector of the vehicle operators.

International

The principal development was the passing of a Federal Clean Air Act in the United States (*S.A.*, 129), following an exhaustive Senatorial inquiry (*S.A.*, 128) Preparations have continued for the comprehensive Council of Europe conference in Strasbourg in June, 1964. (*S.A.*, 127, 129). A Bill has been introduced in the Netherlands to set up an Air Pollution Council (*S.A.*, 126). The report was published of a conference of the International Union of Local Authorities held in Dusseldorf in 1962. (*S.A.*, 127). Dr. E. T. Wilkins has reported on his tour and investigations, under the auspices of the British Council, on the air pollution problems of South America (*S.A.*, 129). Activities have also been reported from France, Australia, the U.S.S.R., and South Africa.

New Housing Bill

Amendments to sections of the Clean Air Act relating to smoke control areas are included in the Housing Bill that was before Parliament at the time of going to press. The purpose of the amendments is to permit or facilitate the new arrangements described in the Ministry Circulars that follow. The amendments will be reported in *Smokeless Air* when the Bill is enacted, and will be noted in the "Clean Air Act in Outline" section of this Year Book in its next edition.

Domestic Fuel Supplies and Clean Air Policy

Following is a summary of the background to the changes in smoke control area arrangements that it has been necessary to bring into operation.

The smoke control area programme, as proposed by the Beaver Committee, 1954, was based on the general availability of gas coke for use in open fires. The Committee pointed out that the advance of technology might bring about changes in fuel availability that could not be foreseen. A number of such changes have occurred, or are being developed, in the gas industry, with the result that (although they will benefit clean air in the provision of more and cheaper gas) open-fire coke production will begin to fall and will in general not be able to meet the requirements of new smoke control areas.

The new situation was examined by the Ministry of Power on behalf of the Ministry of Housing and Local Government, and a report was published in December 1963 by the Ministry of Power with the title "Domestic Fuel Supplies and Clean Air Policy" (Cmnd. 2231, H.M.S.O., 1s. 6d.). This was followed by Circulars from the Ministry of Housing and the Scottish Development Department, describing the new arrangements that would now have to be made for grants in new smoke control areas. Some necessary amendments to the Clean Air Act were also included in what is now the Housing Act, 1964.

For reference we give the conclusions or summaries to the report, firstly on the solid fuels demand and supply position, and secondly by the report's final conclusions or recommendations.

Conclusions on the Solid Smokeless Fuel Position

(a) There should be about enough smokeless solid fuel in total in 1965, but soon after 1965 there may be an overall shortage.

(b) There are quality difficulties, supplies being particularly short in the reactive fuels suitable for use in improved or unimproved open grates. The deficiency may be nearly half a million tons in 1965 and is likely to grow thereafter.

(c) If all the gas coke suitable for use in improved open grates (that is, Gloco) could be reserved for such use, it would be just possible to meet the estimated demand for this kind of fuel in 1965 but, by 1970, there would be a deficiency of about 1½ million tons.

(d) By 1970 the total shortage of fuels for improved and unimproved grates may be about two million tons a year.

(e) Fuels suitable for use in closed appliances should be more than adequate to meet the needs of such appliances throughout the period.

(f) In other words, although the total supplies of solid smokeless fuels should be sufficient to meet an increase in consumption of about 2½ million tons between 1962 and 1970 (which would allow the same annual rate of increase in consumption in the next eight years as in the past four) they may not meet the faster increase indicated by the present demand estimates. Moreover, to use these supplies, consumers may have to make greater use of closed appliances than hitherto.

Recommendations

(1) Adequate supplies of smokeless solid fuel for open grates will continue to be available to meet the needs of existing smoke control areas, including those confirmed but not yet in operation. Supplies, particularly of the reactive fuels, are, however, likely to fall increasingly short of requirements for new areas.

(2) Further efforts by producers to increase the output of open-fire

fuel and to switch supplies from commercial and industrial users should improve matters. It is important that all the producers concerned should take such action as far as can be economically justified and should also examine the case for bringing demand and supply into better balance by price adjustments.

(3) Increased use of closed appliances (including openable stoves) and underfloor draught open grates is desirable.

(4) Gas, oil and electricity provide acceptable alternatives to solid fuels for a large proportion of householders in smoke control areas. These industries should have little difficulty in expanding supplies to the extent necessary to fill the gap in the supply of solid smokeless fuels although in the case of electricity it is desirable that space heating should be done by storage, and not by direct-acting appliances.

(5) The availability and attractiveness of the different smokeless fuels in relation to each other will vary from place to place. Local authorities should consult closely with the fuel and power industries before preparing smoke control orders.

The Circulars

The Circulars issued by the Ministry of Housing and Local Government (69/63) and the Scottish Development Department (58/63) may be summarized as follows.

Established Smoke Control Areas—Sufficient open fire smokeless fuels are available in existing smoke control areas. The new arrangements apply to *future* smoke control areas.

Consultation—Smoke control area proposals should take full account of the local fuel situations. New and better arrangements for consultation with all the fuel producers and distributors are given in detail.

Revised Grant Arrangements—Openable stoves, underfloor draught open fires, and fixed gas, electric storage and oil heaters now rank for full grant. In areas where open fire coke is not available grants will no longer be paid on the installation of improved open fires, but will be paid for the replacement of such fires by other appliances.

New Dwellings—Under the Clean Air Act dwellings begun to be erected after July 5th, 1956, could not rank for conversion grants and under a byelaw obtained by many authorities appliances suitable for smokeless heating were required to be installed in new dwellings. One of the new Housing Act amendments removes the restriction, allowing grants to be made when appropriate in dwellings affected, but imposes a similar restriction on dwellings begun after the enactment of the new Act.

Exchequer Grants—Under the Clean Air Act local authorities may, to prevent hardship, pay more than the normal 7/10ths grant, but no higher proportion could be made by the Exchequer. Under the new arrangements the number of such cases is expected to increase, and the Housing Act amendment permits the Exchequer also to contribute towards the increased grant.

Restrictions on Grant—Another section of the new Act will allow the Minister to withhold grant on any appliances that may unduly strain fuel resources. This will in particular apply to direct heat (as opposed to off-peak storage heat) electrical appliances.

Ignition Appliances—Under the new Act grant will be payable on portable means of ignition even if no "works" are required—this removes a restriction laid down in the 1956 Act.

Retrospective Approval—The new Act permits local authorities to make grants on appliances that have been installed prior to their approval (provided as at present the cost is incurred between the confirmation and the operation of an order).

Credit Facilities—The higher cost of conversions may mean more financial problems, and the Circulars describe how credit facilities for the purchase of heating and cooking appliances may be explained and encouraged.

THE LAW RELATING TO AIR POLLUTION

The principal legislation in Great Britain (excluding Northern Ireland) is the Clean Air Act, 1956. This supersedes the Public Health (Smoke Abatement) Act, 1926, which in its turn amended the smoke abatement section of the Public Health Act, 1875. References to earlier legislation are given in the chronological history of air pollution on another page.

Several amendments to the Clean Air Act, affecting the domestic smoke control provisions, have been included in the Housing Bill before Parliament at the time of going to Press.

A Clean Air Bill, similar to the 1956 Act, was being considered by the Northern Ireland Parliament as this publication was going to press.

Fumes and gases from industrial processes are controlled through the Alkali &c., Works Act, 1906, administered by the Alkali Inspectorate. Under the Clean Air Act smoke, dust and grit emission from certain scheduled processes are also the responsibility of the Inspectorate. (See the section, following, on the Alkali Act.)

Apart from the Clean Air Act it should be noted that action may be taken with regard to smoke or other nuisance from air pollution under common law procedure, and this can be used to secure both damages and an injunction.

In addition to a number of older Local Acts containing smoke abatement provisions, over 50 local authorities obtained powers, between 1946 and 1956, for the establishment of smokeless zones and/or the optional prior approval of new industrial fuel-burning installations. Local authorities may continue to use these provisions unless the relevant sections of their Acts should be repealed, as may be done under section 35 of the Clean Air Act. A number of local authorities have also established smokeless housing estates, where smokelessness is ensured not by legislation but by conditions of tenancy.

Pollution from road vehicles is not controlled under any of the clean air legislation, but through the Road Traffic Act and Regulations, a description of which is given on a following page.

The Clean Air Act in Outline

For a fuller digest of the contents of the Act reference may be made to the *Summary of the Clean Air Act*, published by the Society. The following outline necessarily omits much detail of importance.

SS.1 and 2 deal with **Dark Smoke,** defined as shade No. 2 of the Ringelmann scale. Regulations have been issued on the extent to which dark smoke is permitted. It is an offence to emit dark smoke beyond these limits, and the only defences that may be used are specified: lighting up from a cold furnace; unavoidable failure of plant; unavoidable use of unsuitable fuel; and a combination of any of these. For seven years (from 5th July, 1956) there is a further defence that it was not possible to complete necessary alterations to plant.

(Stat. Inst. 1958. No. 498). (Scotland: Stat. Inst. 1958. No. 1933 (S.106)).

S.3 requires all **New Furnaces,** other than domestic (i.e. less than 55,000 B.Th.U. per hour) to be as smokeless as practicable. Local authorities *must* be notified of new installations and *may* be asked to give prior approval.

S.4 relates to regulations for the installation of **Smoke Density Recorders,** etc.

SS.5 to 9 require all furnaces to use means to minimize **Grit and Dust from Furnaces:** large *new* furnaces (burning more than 1 ton per hour) and all new pulverized fuel furnaces of any size to secure prior approval of grit arresting equipment to be installed; regulations for measuring and recording grit and dust; supplying local authorities with information about such records; and putting outdoor furnaces on the same footing as those in buildings.

S.10, **Height of Chimneys,** gives powers to local authorities to reject plans for new buildings if chimneys are not sufficiently high.

SS.11 to 15 concern **Smoke Control Areas,** which may be established by local authorities under an Order requiring Ministerial approval. Smoke control areas may be entirely smokeless (as with smokeless zones) or may make certain exemptions or impose special conditions. For domestic (and charitable, etc.) premises local authorities may make a grant towards the cost of converting grates, etc., to appliances suitable for smokeless use. The authority may recover part of the grant from the central Exchequer, and normally the cost of conversion will be owner or occupier and local authority 30 per cent each, Exchequer, 40 per cent.

In a case of smoke emission in a control area it is a defence if an authorized fuel only was being burned. Regulations defining authorized fuels have been issued.

(Stat. Inst. 1956, No. 2023).

S.16 deals with **Smoke Nuisances** from smoke other than dark smoke. In this case it is an offence only when a nuisance to inhabitants of the neighbourhood has been proved.

S.17 concerns *processes* that are scheduled as **Special Cases** by Ministerial regulation, and in which the control of pollution will be by the Alkali Inspectorate and not the local authorities. The processes include those that are or will be registered under the Alkali Act. With respect to smoke, grit and dust the Minister may transfer control of particular *premises*, or part of them, to a local authority.

(Stat. Inst. 1958, No. 497). (Scotland: Stat. Inst. 1958, No. 1932 (S.105).)

S.18 on **Colliery Spoilbanks,** requires the owner of a coal or shale mine or quarry to use all practicable means to prevent the combustion of deposited refuse, and to minimize any smoke or fumes that may occur.

S.19 is to the effect that **Railway Engines** are subject to dark smoke emission control as if they were buildings. The owner of the engine must also use any practicable means there may be to minimize smoke emission.

S.20 is to the effect that dark smoke from **Vessels** in specified waters shall be controlled as such smoke from buildings. This applies to vessels in any water not navigable to a sea-going ship and in other defined waters.

(Stat. Inst. 1958, No. 878). (Scotland: Stat. Inst. 1958, No. 1934 (S.107).)

S.21 gives a local authority power of **Exemption** from action under the Act, for a stated period, for research or investigations relevant to the problem of air pollution.

S.22 requires a local authority to report smoke emissions from **Crown Premises** to the Minister responsible for the premises. He must then inquire into the case and if there is cause for complaint must use all practicable means to prevent or minimize the emission or abate the nuisance.

S.23 provides for the Clean Air Council, with the Minister of Housing, Local Government and Welsh Affairs as its Chairman, which has been set up to review progress and obtain advice on air pollution matters. There is also a similar Clean Air Council for Scotland.

(Stat. Inst. 1957, No. 766).

S.24 states that **Building Byelaws** " may require the provision in new buildings of such arrangements for heating or cooking as are calculated to prevent as far as practicable the emission of smoke." (A model byelaw for this purpose has now been issued).

S.25 gives local authorities power to undertake or contribute towards the cost of **Research and Publicity,** etc.

S.26 relates to the improper **Disclosure of Information** obtained as a result of administering the Act.

S.27. **Penalties.** In summary, and in each case quoting the maximum penalty: *Dark Smoke*, private dwellings, £10; other cases, £100 for each offence (e.g. each day). *New furnaces not smokeless:* £10. *Smoke emission in control areas:* £10 for each offence. *Disclosure of Information:* £100 or 3 months imprisonment, or both. *Other offences:* £100.

S.28 relates to **Authorization of Works.**

S.29 on **Enforcement,** refers to the powers of local authorities.

S.30 on **Notification of Offences** is procedural.

SS.31, 32 and 33 deal with administrative and legal matters.

S.34 on **Interpretation,** gives the meaning to be applied to a number of words and phrases used in the Act.

S.35 deals with **Repeals and Transitions.**

S.36 excludes **Northern Ireland** from the provisions of the Act.

S.37 gives the **Short Title** and commencement of the Act.

The First Schedule relates to the confirmation and coming into operation of orders of local authorities under section 11.

The Second Schedule consists of amendments to the Alkali &c., Works Regulation Act, 1906.

The Third Schedule gives modifications of, and provisions supplementary to, Public Health Acts, etc.

The Fourth Schedule lists the enactments repealed by the new Act.

Clean Air Act Regulations

Authorized Fuels

The Smoke Control Areas (Authorized Fuels) Regulations came into force on 31st December, 1956. These relate to section II of the Clean Air Act, which provides for a defence in the case of smoke emission from a building in a smoke control area if it is proved that the smoke " was not caused by the use of any fuel other than an authorized fuel." The fuels authorized in the regulations are: anthracite, briquetted fuels carbonized in the process of manufacture, coke, electricity, gas, low temperature carbonization fuels and low volatile steam coals.

Liquid Fuels

The Model Building Byelaw described above does not include appliances for the use of liquid fuels, nor do the Authorized Fuel Regulations include liquid fuel as an authorized fuel. The Smoke Control Areas (Exempted Fireplaces) Order, 1957, exempts from control under section 11 of the Clean Air Act fireplaces designed or adapted for the combustion of liquid fuel, " provided they are so installed, maintained and operated as to minimize the emission of smoke." Under section II the Minister may make Orders exempting from control in smoke control areas any fireplace that he is satisfied can be used without producing any substantial quantity of smoke when burning other than an authorized fuel. The Order therefore allows for the use of oil-burning appliances in smoke control areas, and also has the effect of allowing such appliances to be included among those permitted under the Model Building Byelaws.

It should be noted that although the use of oil is thus permitted in smoke control areas and under the Building Byelaw, oil remains a non-authorized fuel, so that in case of smoke emission from an oil-burning installation in a smoke control area the authorized fuel defence could not be used.

Mechanical Stokers

The Smoke Control Areas (Exempted Fireplaces) Order, 1959, exempts mechanical stokers from smoke control area orders in the following terms: "Fireplaces, other than fireplaces fired by pulverized fuel, constructed on or after the 31st day of December, 1956, and equipped with mechanical stokers, or adapted on or after that date for use with such stokers," on condition that "the fireplace shall be so installed, maintained and operated as to minimize the emission of smoke. No fuel shall be used other than that for which the mechanical stoker was designed."

Appliances

The Exempted Fireplaces Order, 1959, also exempts two specified appliances: the Solid Fuel Ductair Unit, manufactured by Radiation Ltd., and the Fulgora Slow Combustion Stove, manufactured by Fulgora Stoves, Ltd., on condition that they "shall be so installed, maintained and operated as to minimize the emission of smoke, and in any case in accordance with the manufacturers' instructions." In the case of the Fulgora Stove it is also a condition that "no fuel shall be used other than wood waste in clean condition."

Building Byelaw

Equipment of New Buildings

A Model Byelaw, to meet the provisions of section 24 of the Clean Air Act has been issued by the Ministry of Housing and Local Government. This provides for new buildings to be equipped with such appliances only as are suitably designed to burn gas, electricity, gas coke or anthracite. It does not apply to larger appliances, of a capacity of 55,000B.Th.U. or more per hour, which are controlled by section 3 of the Act. The byelaw does not require smokeless fuels to be used, but ensures that suitable appliances are installed in new buildings which later may be included in a smoke control area. An appliance suitable for gas coke or anthracite will also be suitable for the more reactive cokes and semi-cokes.

Firelighting by Sticks and Paper

Circular 28/60 of the Ministry of Housing and Local Government states that while gas remains the best and most convenient means of lighting solid smokeless fuels in smoke control areas, there will be houses which cannot be supplied with gas at a reasonable cost and also some people may object to having gas at all. For the present, therefore, the Minister accepts that the small amount of smoke caused in this way must be accepted in the general interest of making progress with the creation of smoke control areas.

" The Minister thinks that legal cover for the use of sticks and paper for lighting fires can best be given by the use in smoke control orders of the power of exemption in section 11(3) of the Clean Air Act, 1956. Local authorities could give an exemption in general terms extending to fireplaces in any building or separately occupied parts of a building which is not supplied with town gas; or alternatively, they could give a specific exemption to named individual premises. Either type of exemption should be subject to a condition to secure that it would have effect only where authorized fuels or kindling sticks and paper were being used ".

The Minister asks that such exemption should be included where it is apparent that some buildings or parts of buildings will remain without a gas supply. He also asks that if a local authority should decide not to include an exemption along these lines in such a case, then they should give an explanation when submitting the order for confirmation.

The circular contains a model for a general exemption and also a note on, and includes as appendix II, a document entitled " Smoke Control Areas: Your Questions Answered ". This is not available direct to the public but is published as a guide for local authorities who may wish to produce explanatory booklets for householders in proposed smoke control areas.

Dark Smoke Regulations

In Statutory Instrument 1958, No. 498, " The Dark Smoke (Permitted

Periods) Regulations, 1958," the Minister of Housing and Local Government has made the regulations required for the operation of Section 1 (2) of the Clean Air Act. The Regulations permit the following:

(i) Not more than 10 minutes dark smoke emission in the aggregate from any chimney in any period of 8 hours.

(ii) This permitted time extended to 14 minutes if soot blowing is carried out within the 8 hour period.

(iii) The 10 and 14 minutes to be extended for chimneys serving more than one furnace as follows:
A chimney serving 2 furnaces, 18 and 25 minutes respectively; a chimney serving 3 furnaces, 24 and 34 minutes respectively; a chimney serving 4 or more furnaces, 29 and 41 minutes respectively.

(iv) A continuous emission of dark smoke from the chimneys of factories (other than that caused by sootblowing) for a period not exceeding 4 minutes.

(v) The emission of black smoke up to 2 minutes in the aggregate in any period of 30 minutes.

The regulations apply to dark smoke from the chimneys of factories, shops, offices and railway engines, but not to dark smoke from the funnels of ships, for which separate regulations have been made, as set out below.

Dark Smoke (Permitted Periods) (Vessels) Regulations

These regulations, under s.1(2) of the Clean Air Act, are contained in Statutory Instrument 1958, No. 878. They specify the periods within which dark smoke is permitted from vessels in various classes of case, as detailed in the schedule below. The phrases in italics, "10 minutes in 2 hours", etc., mean that 10 minutes emission of dark smoke *in the aggregate* is permitted in any period of 2 hours.

Schedule—Classes of Case

1. Emissions from a forced draught oil-fired boiler furnace, or an oil engine. 10 *minutes in* 2 *hours.*

2. Emissions from a natural draught oil-fired boiler furnace (except in the cases falling within class 4 below). 10 *minutes in* 1 *hour.*

3. Emissions from a coal-fired boiler furnace:
   (*a*) when the vessel is not under way (except in the cases falling within class 4 below). 10 *minutes in* 1 *hour.*
   (*b*) when the vessel is under way. 20 *minutes in* 1 *hour.*

4. Emissions from a natural draught oil-fired boiler furnace or a coal-fired boiler furnace in the following cases:
   (*a*) a vessel with funnels shortened for the purpose of navigating the Manchester Ship Canal;
   (*b*) a tug not under way, but preparing to get under way or supplying power to other vessels or to shore installations;
   (*c*) a vessel not under way but using main power for the purpose of dredging, lifting, pumping or performing some other special operation for which the vessel is designed. 20 *minutes in* 1 *hour.*

5. Emissions from any other source. 5 *minutes in* 1 *hour.*

In addition, *continuous* dark smoke caused otherwise than by the soot-blowing of a water-tube boiler, shall not exceed:

(1) in the case of classes 1 and 2 above, 4 *minutes.*

(2) in the case of natural draught oil-fired boiler furnaces in class 4, 10 *minutes.*

Further, in *no case* shall black smoke (Ringelmann 4) be emitted for more than 3 *minutes* in the aggregate in any period of 30 *minutes.*

The Alkali, etc., Works Regulation Act

The Alkali, etc., Works Regulation Act, 1906, consolidates and extends previous similar Acts, the first of which was passed in 1863.

The Act includes a schedule of chemical processes and a list of noxious or offensive gases. Since 1906, this schedule and list have been extended by Statutory Orders made under the Public Health (Smoke Abatement) Act, 1926 and the Alkali, etc., Works Regulation (Scotland) Act, 1951. Such orders were made in 1928, 1935, 1939 and 1950. The essence of the Act lies in the requirements that (1) scheduled processes must be registered annually, (2) as a prior condition in the case of a first registration the scheduled process must be provided to the satisfaction of the Chief Inspector with the " best practicable means " for preventing the escape of noxious or offensive gases to the atmosphere and for rendering such gases harmless and inoffensive, (3) the " best practicable means " must thereafter be maintained in good and efficient working order and must be operated continuously, (4) in the case of certain processes, upper limits are specified for the concentration of total acidity in effluent gases which may be discharged to the atmosphere.

Provision is made for the setting up and maintenance of an inspectorate to administer the Act, and regulations are included relating to the registration and inspection of works, general procedure, penalties, etc. The Chief Inspectors are required to make an Annual Report to be laid before Parliament, relating to the work of the inspectorate.

Under the Clean Air Act, 1956, the provisions of the Alkali Act are extended to apply to smoke, dust and grit from premises controlled under the Act as they already do to noxious or offensive gases. Thus from 31st December, 1956 virtually all forms of air pollution from processes registered under the Alkali Act will be subject to control under that Act by the Alkali Inspectorate. Any other parts of a work are the responsibility of the local authority.

The Alkali, etc., Works Orders, 1958, 1961, *and* 1963

The Minister of Housing and Local Government extended the Alkali Act by an Order which came into operation on 1st June, 1958. This Order added to the list of processes scheduled under the Act a number which are responsible principally for smoke, grit and dust. Among these processes are a number for the production of iron and steel, iron or steel melting processes, and some copper and aluminium processes. Gas and coke works, electricity works, coal fired producer gas plant and lime kilns and certain ceramic kilns fired by coal or oil were also added to the list together with sulphate reduction and caustic soda plant and certain types of chemical incinerators. The Order also made the appropriate additions to the list of noxious or offensive gases.

The 1961 Order deals with emissions from the processing of uranium, beryllium, selenium and their compounds. The 1963 Order is much more comprehensive and was prepared largely to take into account the major changes which have taken place in recent years in the heavy chemical and allied industries. It also covers the burning of scrap cable to remove the insulation. This is necessary because of the increasing amount of cable covered with polyvinyl-chloride, which gives rise to phosgene on burning. The Order begins the policy of de-scheduling certain of the 1958 Order Smoke processes.

Chimney Height

The effects of air pollution are proportionate to the concentration of the pollutants, and where pollution is unavoidable (which includes the product of combustion from any fuel, and in particular the gases from sulphur-bearing fuels) it is desirable to secure the greatest dispersion possible. The only legislation to promote the dispersion of chimney gases is Section 10 of the Clean Air Act, 1956. This controls the height of chimneys, other than those of residences, shops and offices. Plans submitted in accordance with building byelaws which show that it is proposed to erect a chimney, may be rejected unless the local authority is satisfied that the chimney will be of a height "sufficient to prevent so far as practicable the smoke grit dust and gases from becoming prejudicial to health or a nuisance".

The Act gives no definition of sufficient height, which depends on the circumstances of each case. Use has been made of various formulae for determining the required height. These formulae are of some complexity and more recently a simpler form of guide has been issued by the Ministry of Housing and Local Government. (Memorandum on Chimney Heights, H.M.S.O., 1963, 1s. 3d. net.)

The calculations required first take account of the amount of sulphur dioxide emitted per hour, and assume that the efflux velocity of the flue gases will not be less than that indicated for different types of installation. The guide then shows how the "uncorrected chimney height" may be calculated. This is the height appropriate for the relevant maximum rate of SO_2 emission when account has been taken of the neighbouring sources of pollution, the local background level of pollution, and the general character of the district. The uncorrected height is never less than 40 feet.

A key of five different types of district is given and by the use of nomograms the uncorrected chimney height for very small, small, medium and large installations is read off. If the uncorrected chimney height thus determined is not less than 2½ times the height of the building to which the chimney is attached, or any other building in the immediate vicinity, no further correction need be made. If however the uncorrected height is less than 2½ times the height of such buildings, a further correction has to be made. This correction is partly based on the ratio between the greatest length and height of the building (to the ridge), since this influences the effect of down-draughts.

On a further nomogram a line is taken from the uncorrected chimney height through a point representing the building height to a reference line. From here another line is drawn through a point representing the height of the building or its greatest length, whichever is lower, to a point indicating the final height. This is subject to any adjustment that may be necessary to ensure that the chimney top is never less than 10 feet above the ridge of the building, nor less than the uncorrected height.

Road Traffic Pollution Law

The Statutory Regulations governing the emission of smoke or other forms of pollution from road vehicles are made by the Minister of Transport and Civil Aviation in exercise of the powers conferred on him by sections 3, 17, 30, and 111 of the Road Traffic Act, 1930 (20 & 21 Geo.5.c.43.).

The Regulations at present operative came into force on 2nd April, 1955, and are known as "The Motor Vehicles (Construction and Use) Regulations 1955. (Statutory Instruments 1955, No. 482)." Under Part IIA. of the Regulations, governing the construction, weight and equipment of vehicles, Regulation 21 (Emission of smoke or vapour), states: "Every motor vehicle shall be so constructed that no avoidable smoke or visible vapour is emitted therefrom."

Part III of the Regulations, governing the use of vehicles, has been amended by the Motor Vehicles (Construction and Use) (Amendment) Regulations, 1957. (Statutory Instruments 1957, No. 359). The Amending Regulation is No. 2. (8), and is worded as follows:

"2. The Motor Vehicles (Construction and Use) Regulations, 1955 as amended shall have effect as though—

8) for Regulation 79 there were substituted the following Regulation: 'Use of vehicles so as not to emit smoke, etc.

79. No person shall use or cause or permit to be used on a road any motor vehicle from which any smoke, visible vapour, grit, sparks, ashes, cinders, or oily substance is emitted if the emission thereof causes or is likely to cause damage to any property or injury to any person who is actually at the time or who reasonably may be expected on the road, or is likely to cause danger to any such person as aforesaid.' "

In 1961 further regulations have come into force to amend the Motor Vehicles (Construction and Use) Regulations, 1955, as follows:

1) the maximum permitted length of a public service vehicle is increased from 30 feet to 36 feet and the maximum permitted width from 8 feet to 8 feet 2½ inches (Regulation 2 (1), (2) and (3));

(2) new provision is made requiring that where a motor vehicle propelled by a compression ignition engine is fitted with a device for starting the engine by supplying it with excess fuel, the device cannot readily be used by any person on the vehicle: this requirement applies on and after 1st July, 1962, to vehicles registered before 1st January, 1962, and to all other vehicles on and after 1st January, 1962 (Regulation 2 (4)); and

(3) provision is made requiring that such a device as aforesaid be so maintained that it does not operate and a prohibition is imposed on the use of such a device, while the vehicle to which it is fitted is in motion on a road (Regulation 2 (5)).

The Cost of Air Pollution

The most recent general inquiry into the cost of air pollution in Britain was made by a sub-committee of the Committee on Air Pollution (the Beaver Committee), the findings of which were included as an appendix in the final report of the Committee in 1954. Members of the Committee have since stated that they consider the estimates to be too conservative.

The main conclusions of the Report were:

(1) The direct costs of pollution to which figures can be put ("however hazardous") are as follows:

	£m. per annum
Laundry	25
Painting and decorating ..	30
Cleaning and depreciation of buildings other than houses ..	20
Corrosion of metals	25
Damage to textiles and other goods	52·5
	152·5

It is considered that these figures are under-estimates, and as certain items have been omitted, it is concluded that the direct costs of air pollution are *of the order of at least £150 million a year.*

(2) The "loss of efficiency". The following figures are given as "a rough guess at possible orders of magnitude": £10m. a year loss to agriculture; £55m. a year loss of working efficiency in manufacturing industry; £60m. a year in other sections, including transport—altogether "the loss of efficiency resulting from pollution might be as great as the direct costs", but to avoid danger of over-estimates a figure of £100m. a year is suggested.

(3) The value of the fuel lost under the conditions which produce smoke is estimated to be £25m. to £50m. a year, but it is considered that this should not be included as one of the costs of pollution.

The total estimated cost is given as £250m. a year, equivalent to £10 per head in the black areas and £5 elsewhere throughout Great Britain, plus the value of the fuel lost.

SMOKE CONTROL AREAS

Programmes and Progress

The following lists contain the names of Local Authorities in the "Black Areas", with (1) the target date for completion of their Smoke Control Programme, (2) the final acreage (3) acreage in operation on April 1, 1964 (4) total number of premises in operation on April 1, 1964.

The figures have been compiled as accurately as possible from information received by the Society directly from many of the Local Authorities listed, from the records at the Ministry of Housing and Local Government, and from "Smoke Control" 1962-66. Where no figures are given in columns 1 and 2 this means that the Authority in question has not submitted a programme to the Minister of Housing and Local Government.

*The figures in italics refer to acres and premises in smokeless zones established by some Local Authorities before the Clean Air Act and in areas where smoke control operates through tenancy agreements. * indicates that a programme has been deferred, suspended or delayed.*

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.4.64	4 *Premises (In Oper.)* 1.4.64
Tyneside and Wearside				
Gateshead C.B.	1980	4,677	105	1,340
Newcastle C.B.	1980	11,401	3,228	10,211
South Shields C.B.	—	—	—	—
Sunderland C.B.	1980	9,013	175	935
Tynemouth C.B.	1987	5,000	—	—
Jarrow B.	1970	1,500	88	894
Wallsend B.	1975	3,544	271	2,876
Blaydon U.D.	—	—	291	735
Boldon U.D.	—	—	—	—
Felling U.D.	—	—	366	2,800
Gosforth U.D.	1970	—	—	—
Hebburn U.D.	1974	1,563	556	1,136
Longbenton U.D.	—	—	—	—
Newburn U.D.	1975	4,648	318	2,115
Ryton U.D.	—	—	—	—
Whickham U.D.	1972	6,213	—	—
Teeside				
Darlington C.B.	—	—	—	—
Middlesbrough C.B.	1974	7,131	2,520	12,637
West Hartlepool C.B.	1973	4,976	668	330
Hartlepool B.	1970	1,608	—	—
Stockton-on-Tees B.	1982	6,084	—	—
Thornaby-on-Tees B.	1971	1,993	882	435
Billingham U.D.	1966	2,092	500	1,885
Eston U.D.	1972	3,000	38	494
West Riding (North)				
Bradford C.B.	1975	25,503	3,079 *1,481*	20,624 *14,284*
Dewsbury C.B.	1975	6,720	232	2,498
Halifax C.B.	1977	14,081	1,635	7,960
Huddersfield C.B.	1980	14,147	1,621	3,875
Leeds C.B.	1975	40,613	2,296	19,384
Wakefield C.B.	1977	5,800	614	1,638

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.4.64	4 *Premises (In Oper.)* 1.4.64
West Riding North (continued)				
Batley B.	1977	4,461	490	1,449
Brighouse B.	1975	7,875	1,755	2,696
Castleford B.	—	—	—	—
Keighley B.	1970	3,238	250	2,812
Morley B.	1977	9,994	2,545	2,955
Ossett B.	1969	3,332	424	1,869
Pontefract B.	1979	4,865	611	802
Pudsey B.	1980	5,205	16	173
Spenborough B.	1972	8,600	1,452	2,631
Aireborough U.D.	1970	6,856	2,180	2,777
Baildon U.D.	1970	2,830	—	—
Bingley U.D.	1970	11,018	1,437	3,222
Denholme U.D.	—	—	—	—
Elland U.D.	1978	5,951	30	423
Featherstone U.D.	—	—	—	—
Heckmondwike U.D.	1970	697	166	588
Horbury U.D.	1969	1,280	—	—
Horsforth U.D.	1968/70	2,706	285	2,292
Knottingley U.D.	1969	2,837	412	1,400
Mirfield U.D.	1979	—	274	823
Normanton U.D.	1979	3,061	—	—
Queensbury & Shelf U.D.	1975	2,795	455	898
Rothwell U.D.	1971	10,695	195	645
Shipley U.D.	1974	2,184	774	2,853
Sowerby Bridge U.D.	1973	4,000	—	—
Stanley U.D.	—	5,169	370	310
West Riding (South)				
Barnsley C.B.	1981	7,811	414	954
Doncaster C.B.	1970	8,371	1,396	5,795
Rotherham C.B.	1973	8,000	1,068	5,234
Sheffield C.B.	1972	39,598	14,017	42,571
Conisborough U.D.	—	—	—	—
Cudworth U.D.	1975	1,746	—	—
Darfield U.D.	—	—	—	—
Darton U.D.	1972	4,718	—	—
Dearne U.D.	—	—	—	—
Dodworth U.D.	—	—	—	—
Hoyland Nether U.D.	—	—	—	—
Mexborough U.D.	—	—	—	—
Rawmarsh U.D.	—	—	—	—
Royston U.D.	—	—	—	—
Swinton U.D.	—*	—	—	—
Wath-upon-Dearne U.D.	1972	2,665	10	90
Wombwell U.D.	—	—	—	—
Worsborough U.D.	1976	1,660	—	—
Rotherham R.D.	—	—	—	—
East Riding				
Kingston-upon-Hull C.B.	1971	12,000	4,848	27,682
Derby, Nottingham and Chesterfield				
Derby C.B.	1986	8,000	481	3,117
Nottingham C.B.	1975	18,364	2,444	10,039
			125	*2,000*

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.) 1.4.64*	4 *Premises (In Oper.) 1.4.64*
Derby, Nottingham Chesterfield (continued)				
Chesterfield B.	1975	8,472	1,202	4,943
Ilkeston B.	1983	3,017	—	—
Mansfield B.	1980	7,009	955	2,229
Alfreton U.D.	—	5,023	—	—
Arnold U.D.	—	—	—	—
Beeston & Stapleford U.D. ..	1975	6,468	839	1,971
Bolsover U.D.	1974	4,326	86	167
Carlton U.D.	1970	4,018	46	332
Dronfield U.D.	1970	4,567	—	—
Eastwood U.D.	—	—	—	—
Hucknall U.D.	—	4,029	—	—
Kirkby-in-Ashfield U.D.	—	—	—	—
Long Eaton U.D.	1975	3,559	13 *57*	112 *750*
Mansfield Woodhouse U.D. ..	—	—	—	—
Staveley U.D.	1976	6,504	—	—
Sutton in Ashfield U.D.	1982	165	—	—
West Bridgford U.D.	—	3,045	—	—
Basford R.D.	—	—	—	—
Chesterfield R.D.	1972	29,000	501	2,536
North Midlands				
Leicester C.B.	1975	16,990	2,250	10,988
County of London				
City of London	*completed* (1955)	677	*677*	*21,700*
Battersea M.B.	1972	2,140	578	6,387
Bermondsey M.B.	1970*	1,135	485	6,738
Bethnal Green M.B.	1964	760	694	15,486
Camberwell M.B.	1968	4,480	1,696	11,348
Chelsea M.B.	1968	660	204	8,007
Deptford M.B.	1970	1,564	637	10,661
Finsbury M.B.	1967	587	263	3,991
Fulham M.B.	1964	1,706	1,003	29,790
Greenwich M.B.	1970	3,858	573	5,905
Hackney M.B.	1966	3,287	2,011	30,188
Hammersmith M.B.	1967	2,282	632	12,757
Hampstead M.B.	1967	2,265	793	15,108
Holborn M.B.	*completed* (1962)	405	405	19,479
Islington M.B.	1970	3,092	788	14,161
Kensington M.B.	1970	2,291	768	14,983
Lambeth M.B.	1975	4,088	405	7,036
Lewisham M.B.	1966	7,015	3,850	41,207
Paddington M.B.	1968	1,408	400	18,377
Poplar M.B.	1964	1,816	428	6,452
St. Marylebone M.B.	1965	1,473	743	23,503
St. Pancras M.B.	1966	2,694	1,552	22,313
Shoreditch M.B.	1965	664	460	10,266
Southwark M.B.	1972	1,131	78	2,717
Stepney M.B.	1970	1,692	492	8,465
Stoke Newington M.B.	*completed* (1963)	863	863	31,123
Wandsworth M.B.	1975	9,201	2,422	16,371
Westminster M.B.	1964	2,504	2,036	27,199
Woolwich M.B.	1968	8,282	2,874	20,914

	1 Target Date	2 Final Acreage	3 Acreage (In Oper.) 1.4.64	4 Premises (In Oper.) 1.4.64
Outer London				
Croydon C.B.	1973	12,672	1,967	15,066
East Ham C.B.	1973	3,326	—	—
West Ham C.B.	—	4,680	91	1,115
Acton B.	1968	2,319	591	9,131
Barking B.	1964	3,934	1,458	13,980
			161	*2,112*
Barnes B.	1968	2,650	911	4,970
Beckenham B.	1971	5,935	936	5,201
Beddington & Wallington B.	1969	3,048	1,090	2,931
Bexley B.	1975	4,869	120	1,367
Brentford & Chiswick B.	1969/70	2,449	697	3,469
Bromley B.	1975	6,519	781	3,902
Chingford B.	1974	2,868	523	3,751
Dagenham B.	1969	4,200	1,070	12,826
Dartford B.	1976	4,292	574	2,995
Ealing B.	1974	8,781	2,610	17,011
Edmonton B.	1966	3,895	1,223	10,174
Enfield B.	1972	12,400	7,787	8,399
Epsom & Ewell B. (part)	—	—	—	—
Erith B.	1975	3,859	—	—
Finchley B.	1969	3,478	1,449	9,577
Harrow B.	1975	12,555	1,043	9,389
Hendon B.	1975	10,371	1,733	5,243
Heston & Isleworth B.	1970	7,261	1,316	7,114
Hornsey B.	1968	2,871	1,753	13,299
Ilford B.	1972	8,411	319	2,607
Kingston-on-Thames B.	1970	1,426	316	3,089
Leyton B.	1974	2,594	458	3,014
Malden & Coombe B.	1972	3,164	1,001	3,390
Mitcham B.	1971	2,929	118	1,125
Richmond B.	1968	4,243	2,499	5,486
Romford B.	1973*	9,342	899	2,109
Southall B.	1969	2,608	291	3,537
Southgate B.	1972	3,765	1,310	6,030
Surbiton B. (part)	—	—	—	—
Sutton & Cheam B.	1975	4,338	—	—
Tottenham B.	1967	3,013	1,353	23,173
Twickenham B.	1970	7,078	760	5,733
Walthamstow B.	1967	4,343	1,104	13,356
Wanstead & Woodford B.	1967	3,824	1,585	8,258
Wembley B.	1973	6,000	1,934	8,059
Willesden B.	1971	4,634	1,265	17,409
Wimbledon B.	1975	3,211	322	1,121
Wood Green B.	1968	1,606	994	6,648
Carshalton U.D.	1970	3,346	636	6,171
Chislehurst & Sidcup U.D.	—	—	—	—
Crayford U.D.	1967*	2,698	845	986
East Barnet U.D.	1972	2,644	714	4,384
Feltham U.D.	1969	4,925	2,305	5,135
Friern Barnet U.D.	1968	1,340	430	2,491
Hayes & Harlington U.D.	1966	5,159	4,068	13,420
Merton & Morden U.D.	1975	3,138	866	4,714
Penge U.D.	1970	770	115	1,533
Ruislip & Northwood U.D.	—	—	—	—

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.4.64	4 *Premises (In Oper.)* 1.4.64
South Lancashire and North-East Cheshire				
Bolton C.B.	1970	5,401	1,451	11,451
			86	*1,050*
Bury C.B.	1971	2,168	568	2,385
Manchester C.B.	1969	27,255	8,074	40,326
			523	*4,764*
Oldham C.B.	—	6,392	1,346	3,740
Rochdale C.B.	1971	9,556	2,830	8,515
			67	*337*
Salford C.B.	1967	5,202	1,485	10,194
			57	*1,859*
Stockport C.B.	1975	8,439	1,007	7,192
Wigan C.B.	1973	5,083	1,256	3,074
Altrincham B.	1973	3,519	45	547
Ashton-under-Lyne B.	1973	4,146	452	1,992
Dukinfield B.	—	1,725	616	300
Eccles B.	1970*	3,417	1,789	2,034
Farnworth B.	1974	1,504	—	—
Heywood B.	1970	8,342	1,245	3,641
Hyde B.	1975	4,170	850	6,143
Leigh B.	1971	6,359	475	3,302
Middleton B.	1981	5,170	1,128	6,587
Mossley B.	1970	1,200	54	541
Prestwich B.	1975	2,420	2,279	3,150
Radcliffe B.	—	4,915	477	843
Sale B.	1970	3,628	1,537	7,132
Stalybridge B.	1975	3,030	500	2,280
Stretford B.	1969	3,530	805	3,701
Swinton & Pendlebury B.	1975	3,363	599	2,626
Abram U.D.	—	—	—	—
Aspull U.D.	—	—	—	—
Atherton U.D.	1970	2,289	120	214
Audenshaw U.D.	1973	1,241	49	428
Blackrod U.D.	—	—	—	—
Bredbury & Romiley U.D.	1973	688	442	1,409
Chadderton U.D.	1969	3,013	886	2,777
Cheadle & Gatley U.D.	1966	5,285	2,047	6,488
Crompton U.D.	—	2,865	419	1,316
Denton U.D.	1970	2,592	1,323	6,162
Droylsden U.D.	1973	1,245	207	1,824
Failsworth U.D.	1970	1,663	204	1,931
Golborne U.D.	1975	5,765	—	—
Hindley U.D.	1979	2,612	225	999
Horwich U.D.	—	—	—	—
Ince in Makerfield U.D.	—*	—*	—	—
Irlam U.D.	—*	4,717	748	2,541
Kearsley U.D.	1975	1,720	—	—
Lees U.D.	—	—	—	—
Little Lever U.D.	—	808	—	—
Royton U.D.	1973	2,149	202	312
Tottington U.D.	—	2,544	—	—
Tyldesley U.D.	1975	5,174	—	—
Urmston U.D.	1972	3,944	404	2,595
Westhoughton U.D.	1979	5,834	120	607
Whitefield U.D.	1967	3,386	2,976	2,893
Worsley U.D.	1973	7,240	262	2,131

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.4.64	4 *Premises (In Oper.)* 1.4.64
Central Lancashire				
Blackburn C.B.	1985	8,088	514	4,150
Burnley C.B.	1971	4,695	247	2,439
Preston C.B.	1975	6,357	584	4,359
			176	*1,918*
Accrington B.	1975	4,418	—	—
Colne B.	1976	817	86	718
Darwen B.	1975	—	279	572
Nelson B.	—*	—	—	—
Barrowford U.D.	—	—	—	—
Brierfield U.D.	—	–	—	—
Church U.D.	1980	528	194	775
Clayton-le-Moors U.D.	1975	1,060	—	—
Fulwood U.D.	1975	3,164	—	—
Great Harwood U.D.	—*	—	—	—
Oswaldtwistle U.D.	—	—	—	—
Padiham U.D.	—	976	493	1,350
Rishton U.D.	1979	1,087	—	—
Merseyside				
Birkenhead C.B.	1979	8,043	1,980	3,721
Bootle C.B.	1975	3,054	604	3,904
Liverpool C.B.	1970	27,818	7,671	30,551
St. Helens C.B.	1970	8,865	—	—
Wallasey C.B.	—	5,961	2,964	8,378
Warrington C.B.	1980	4,639	616	6,031
Bebington B.	1980	2,220	544	3,504
Ellesmere Port B.	1977	3,724	866	4,707
Widnes B.	1970	4,500	1,761	3,988
Ashton-in-Makerfield U.D. ..	—	—	—	–
Haydock U.D.	—	—	—	—
Huyton-with-Roby U.D. ..	1970	3,054	683	2,701
Kirkby U.D.	1965	2,072	502	3,346
Litherland U.D.	—	1,180	—	—
Newton-le-Willows U.D.	1978	2,800	152	1,068
Prescot U.D.	1976	748	124	1,152
Runcorn U.D.	1970	3,116	845	2,628
West Midlands				
Birmingham C.B.	1974	51,147	3,534	29,656
			203	*1,387*
Coventry C.B.	1978	19,171	1,821	8,702
			30	*232*
Dudley C.B.	1975	4,328	1,146	6,198
Smethwick C.B.	1979	2,500	335	3,370
Walsall C.B.	1980	8,777	164	1,411
West Bromwich C.B.	1980	7,172	125	6,824
Wolverhampton C.B.	1979	—	731	2,109
Bilston B.	–	—	—	—
Halesowen B.	1970	5,247	659	2,883
Nuneaton B.	1978	11,767	2,506	3,394
Oldbury B.	1984	3,304	306	1,770
Rowley Regis B.	—	—	—	—
Solihull B.	1989	13,645	376	1,582

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.4.64	4 *Premises (In Oper.)* 1.4.64
West Midland (Continued)				
Stourbridge B.	1975	4,000	427	1,787
Sutton Coldfield B.	1979	13,978	—	—
Tipton B.	1971	2,167	—	—
Wednesbury B.	1970	959	120	1,286
Aldridge U.D.	—	9,284	743	6,891
Amblecote U.D.	1974	665	—	—
Bedworth U.D.	—	—	—	—
Brierley Hill U.D.	1974	5,000	967	5,161
Brownhills U.D.	—	—	70	657
Coseley U.D.	1966	—	—	—
Darlaston U.D.	—	—	—	—
Sedgley U.D.	1973	3,823	1,127	2,191
Wednesfield U.D.	1970/72	2,515	760	3,441
Willenhall U.D.	1972	2,834	220	2,591
Potteries				
Stoke-on-Trent C.B.	1980	21,209	1,791	1,615
Newcastle-under-Lyme B.	1980	8,882	1,995	3,317
Kidsgrove U.D.	1979/80	4,095	—	—
Bristol				
Bristol C.B.	1975	26,345	3,471	14,472
South Wales and Monmouthshire				
Newport C.B.	—	—	43	651
Pontypridd			*8,141*	*12,717*

(By arrangement, only low volatile coal to be sold in the area).

No other Authority in the region has yet submitted a programme or established a smoke control area.

Local Authorities outside the Black Areas

Local Authorities outside the Black Areas who have Smoke Control Areas in operation, with total acreages and premises to 1.4.64.

	Acreage	*Premises*		*Acreage*	*Premises*
Barnet U.D.	458	1,722	Gillingham B.	2,758	5,980
Basildon U.D.	260	2,209	Grantham B.	680	2,416
Bedford B.	156	911	Harlow U.D.	4,033	9,274
Blaby R.D.	267	1,850	Hemel Hempstead B.	400	2,239
Brentwood U.D.	109	1,371	High Wycombe B.	1,222	3,938
Cambridge B.	23	279	Hornchurch U.D.	3,557	15,424
Chatham B.	657	3,506	Lancaster B.	32	746
Cheltenham B.	588	1,493	Leamington Spa B.	841	2,414
Cheshunt U.D.	671	2,951	Leek U.D.	96	18
Connah's Quay (Flintshire) U.D.	53	—	Lincoln C.B.	1,389	408
Corby U.D.	440	3,566	Luton C.B.	236	3,293
Crawley U.D.	2,768	7,058	Marple U.D. (deferred)	69	405
Crewe B.	270	1,087	Northfleet U.D.	393	1,317
Derbyshire R.D.	28	288	Old Fletton U.D.	85	672
Elstree R.D.	500	2,877	Oxford C.B.	798	1,698
Exeter C.B.	251	2,091	Reading C.B.	595	3,194

	Acreage	*Premises*
Rochester B. ..	830	1,974
Saddleworth U.D. ..	227	413
Scunthorpe B. ..	1,851	3,597
Shrewsbury B. ..	379	582
Skipton U.D. ..	69	370
Slough B.	1,354	4,800
Southampton C.B. ..	109	577
Southport C.B. ..	67	250
Staines U.D. ..	5,332	5,161
Thurrock U.D. ..	2,031	5,170
Todmorden B. ..	185	1,006

	Acreage	*Premises*
Warwick B. ..	124	1,011
Watford B. (suspended)	561	1,413
Wellington U.D. ..	232	11
Wilmslow U.D. (suspended)	257	1,803
Winsford U.D. ..	433	4,225
Wortley R.D. ..	460	1,368
Wrexham (Wales) B.	50	437
Yiewsley & W. Drayton U.D.	2,754	3,928

Scotland

Total Acreage and Premises in Operation at 1.4.64.

	Acreage	*Premises*
Clydebank	445	2,050
Coatbridge	106	838
Dumbarton ..	1,039	3,087
Dundee	2,782	9,014
East Kilbride ..	480	2,462
Edinburgh	2,016	11,932
Falkirk	121	736

	Acreage	*Premises*
Glasgow	11,340	30,269
Grangemouth ..	160	1,518
Kilmarnock ..	77	273
Motherwell	258	1,706
	1	*22*
Paisley	2,565	7,279
Stirling County ..	253	1,279

Smoke Control Areas Summary

As at March 31, 1964

(1)	(2)	(3)	(4)	(5)
Region	*No. of acres covered by smoke control orders confirmed or awaiting decision*	*Percentage* of total black area acreage in the region so covered*	*No. of premises covered by smoke control orders confirmed or awaiting decision*	*Percentage* of total black area premises in the region so covered*
Northern	16,010	12·8	76,285	13·8[1]
East and West Ridings ..	68,000	18·1	244,925	21·0[2]
North Midlands ..	16,055	6·0	58,210	11·4
Greater London ..	111,975	34·2	1,017,155	38·5
North Western ..	78,785	19·6	348,340	20·5[3]
Midlands	34,730	14·0	164,945	15·7
South Western ..	5,050	19·2	18,105	12·2
Wales and Monmouthshire	45	0·01	650	0·2
Totals	330,650	15·7	1,928,615	23·5

* The percentage shown in columns (3) and (5) above are percentages of the *total* acreage and of the *total* number of premises in the black areas concerned. In practice it may not always be necessary for the whole of a black area authority's district to be covered by smoke control (e.g. there may be some areas of open country).

[1] Tynemouth C.B. Nos. 1-7 Orders, withdrawn

[2] Queensbury and Shelf Borough No. 3 order, withdrawn

[3] Colne Borough No. 3 Order } withdrawn
Irlam U.D.C. No. 3 Order }

Estimates of Air Pollution

from the Main Uses of Fuels in Great Britain in the Year 1962

Figures are in millions of tons to the nearest 0·1 million tons for quantities of fuel and to the nearest 0·01 million tons for sulphur dioxide

The table has been prepared by Dr. Albert Parker, C.B.E.

Fuel and Class of Consumer	*Quantity of Fuel*	*Pollutants Discharged*		
		Smoke	*Grit and Dust*	*Sulphur Dioxide*
Coal				
Domestic (including miners' coal)	33·1	1·2	0·1	0·85
Electricity works	60·4	small	0·3	1·74
Railways	6·1	0·1	0·1	0·18
Industrial and miscellaneous	43·2	0·2	0·3(*a*)	1·24
Coke ovens	23·5	small	small	0·08
Gas works	22·1	small	small	0·16
	188·4			
Coke (excluding consumption in gas works and blast furnaces)				
Domestic coke and other solid smokeless fuels	4·8	nil	small	0·10
Industrial and miscellaneous	10·8	nil	small	0·25
	—	1·5	0·8	4·60
Oil				
Domestic				
Kerosene and domestic fuel oils	1·8	very small	nil	0·01
Industrial				
Kerosene, gas/diesel, fuel oils and creosote-pitch	28·4(*b*)	small	nil	1·38
Road and Rail Transport				
Motor spirit, gas/diesel, and fuel oils	12·2	small	nil	0·06
Marine Craft				
Gas/diesel and fuel oils	1·2	small	nil	0·04
	43·6(*c*)	small	nil	1·49
Total for coal and oil	—	1·5	0·8	6·09

(*a*) Excluding grit and dust emissions, estimated at about 0·5 million tons from industrial processes other than steam raising.

(*b*) The amount of 28·4 million tons of oil is equivalent in heating value to about 48 million tons of coal, which if used for the same purposes would have produced about 0·2 million tons of smoke, 0·3 million tons of grit and dust, and 1·38 million tons of sulphur dioxide.

(*c*) The amount of 43·6 million tons of oil is equivalent to about 74 million tons of coal, so that the coal equivalent of the coal and oil consumed (excluding air transport) in Great Britain in 1962 was about 262 million tons.

Warren Spring

The Work of the Warren Spring Laboratory of the Department of Scientific and Industrial Research on the Investigation of Air Pollution and its Abatement

Warren Spring Laboratory carries out research on the nature and extent of air pollution, and on its prevention and abatement, in order to provide technical information necessary for the administration of clean air legislation, for town planning and the location of industry, and for research into the effects of air pollution.

The National Survey of Air Pollution

The National Survey, devised by Warren Spring Laboratory, is planned statistically to enable valid conclusions to be drawn on the incidence of air pollution in urban areas throughout the country, while restricting observations to a reasonably small number of sites. Some 120 towns were chosen for the purpose and each agreed to make daily measurements of smoke and sulphur dioxide in the following five types of district, in so far as examples are to be found in each town:

(a) Residential area with a high population density, such as old terrace housing.
(b) Residential area with a low population density, such as a housing estate or suburb.
(c) Industrial area.
(d) Commercial area, with central heating predominating.
(e) Smoke control area, which may be any of the above types.

Observations are also being made at a number of sites in the depth of the country to give background information. All sites for the survey were chosen by the local authority in collaboration with Warren Spring Laboratory, and on March 31, 1964, observations for this statistically-planned part of the Survey were being made by 147 local authorities and others at 465 sites.

In addition, a further total of 308 local authorities and others were making daily observations of smoke and sulphur dioxide at 571 sites. These measurements are being made on the initiative of the authorities concerned, and primarily for their own local purposes, but they form a second part of the National Survey and comparison of these results with the national averages established by the first part of the survey will be of great value. For this reason, the sites are inspected by Warren Spring Laboratory and codified.

The data from both parts of the survey are handled by a computer.

Other Measurements of Air Pollution

In addition to the daily smoke and sulphur dioxide observations, many local authorities and other bodies make monthly measurements of grit- and dust-fall, using the British Standard Deposit Gauge, and of the rate of reaction of sulphur compounds with lead dioxide. Warren Spring Laboratory continues to give advice and help in connection with such measurements, and also publishes the results and the conclusions to be drawn from them.

Standing Conference of Co-operating Bodies in the Investigation of Atmospheric Pollution

All local authorities and other organizations who make measurements of air pollution, either as part of the National Survey or purely for their own local purposes, and who submit the data regularly to Warren Spring Laboratory for publication, are entitled to send representatives to the Standing Conference of Co-operating Bodies in the Investigation of Atmospheric Pollution, which meets twice yearly to discuss matters of interest connected with air pollution. Other bodies may do so on payment of a subscription. At March 31, 1964, 417 bodies had appointed representatives to the Conference.

Publication of Results

All data submitted to the Laboratory are collated, and summaries are published in a Monthly Bulletin, one section of which deals with daily measurements of smoke and sulphur dioxide, and another with monthly measurements made with the deposit gauge and the lead dioxide instrument. A third section of the Bulletin contains abstracts of papers and other information on air pollution that have appeared in the period concerned. Annual Summaries of the data are also published.

These Bulletins and Annual Summaries, which are circulated to members of the Standing Conference and to other bodies making measurements, are available on request to all concerned with problems of air pollution.

In addition, a series of Reports on the Investigation of Atmospheric Pollution published by H.M. Stationery Office, gives analyses of these results and an account of research on the measurement and abatement of air pollution.

Accuracy and Reliability of Instruments

A scheme which requires measurements to be made by many people, of varied skills, calls for simple instruments which provide a sufficient degree of accuracy and reproducibility of results, and Warren Spring Laboratory is continuing its research aimed at improving instruments. The same need is apparent when it is necessary to compare results from different countries and a Working Party set up by the Organization for Economic Co-operation and Development (O.E.C.D.) has been comparing instruments used in different countries for determining pollutants. The Chairman and Secretary of the Working Party were drawn from the Laboratory.

Distribution of Pollution in Towns

Studies of the distribution of pollution in towns are being continued. A survey in Sheffield is being undertaken in co-operation with the Department of Geography of the University of Sheffield to examine the build-up and dispersion of pollution over the city. The topography of the town, weather conditions, and relation of industry to housing are being examined. In Edinburgh, a survey of air pollution is being carried out, with the support of the Laboratory, by the Department of Geography of the University of Edinburgh.

Background information necessary for the interpretation of data from surveys in towns is being obtained by micro-surveys aimed at defining how far the readings registered by an instrument may be typical of pollution in the surrounding area.

Pollution from Chimneys

Two studies are being carried out in connection with the height of chimneys. The problem of the entrainment of pollution by down-draughts near buildings is being studied by means of a furnace and chimney that can be erected at various positions in relation to the large laboratory block at Warren Spring Laboratory. Parallel tests are being carried out by the National Physical Laboratory on corresponding models in a wind tunnel. This investigation has been undertaken at the request of the Federation of British Industries.

The second investigation consists in measuring the distribution of a tracer emitted from a low chimney in an urban area to study the dispersion of chimney gases in such areas.

Removal of Oxides of Sulphur from Flue Gas

Successful laboratory-scale investigations of the Reinluft Process have led to the installation at the Laboratory of an experimental pilot plant to treat flue gas at a rate of 16,000 ft^3/h, and work with this plant is now in progress. In this process, oxides of sulphur are removed by adsorption on a carbonaceous contact material from which they are later desorbed at a higher temperature in the form of concentrated sulphur dioxide.

Diesel Exhausts

It is now generally accepted that correct maintenance and operation of diesel engines provide the only practicable means of preventing smoke. At the request of the Ministry of Transport the possibility of deciding from a simple test on a stationary vehicle how much smoke it would emit under working conditions has been examined; such a test would facilitate the enforcement of the law covering the emission of smoke from vehicles.

The City and Guilds of London Institute

There have been no very recent alterations to the examinations scheme of the City and Guilds of London Institute in those subjects which are likely to interest the readers of this Year Book.

It may, however, be helpful to summarize the existing schemes; in all cases the Institute will be pleased to supply further detailed information on application to: 76 Portland Place, London, W.1.

The Boiler Operator's Certificate is designed to test the practical ability of stokers, firemen and others for intelligent and efficient operation of various types of boilers. It also ensures that they have a sound basic knowledge of the necessary principles.

This examination is not at present available to operators of fully automatic boilers, but the Institute is examining the possibility of providing a useful and satisfactory scheme for these types of plant.

Steam Turbine Plant Operation is broadly comparable to the previous scheme but designed for turbine drivers and auxiliary plant attendants.

Boilerhouse Practice provides a further qualification for those employed in boiler-houses, and also provides an intermediate qualification for those who wish to study Combustion Engineering Practice or Power Plant Operation. This examination is recognized by the Royal Society of Health in connection with the Smoke Inspector's examination.

Steam Utilization Practice may similarly interest steam turbine plant operators and is an examination intended for maintenance men whose approach has to be primarily practical. It deals in a non-academic manner with practical problems in the use of steam and high pressure hot water.

Combustion Engineering Practice is an advanced course for boiler-house staff, fuel efficiency engineers and chemists, who are concerned with the efficient operation, maintenance and testing of boiler plant and industrial furnaces.

Power Plant Operation is a similar advanced course for senior grade operators employed in power stations where steam power generation plant is in use.

The National Industrial Fuel Efficiency Service

The National Industrial Fuel Efficiency Service, formed in May, 1954, is a non-profit organization which offers industry, local authorities and commercial property owners practical help in the use of heat and power, whatever type of fuel is used.

N.I.F.E.S. services include Heat and Power Surveys, which show by precise measurement where waste occurs in factory premises and how it can be prevented. This service is also used in plant extension or development projects. Boiler house efficiency tests and methods of increasing the efficiency of steam-raising plant. Advice on improving the efficiency of heat-using process plant, furnaces and power plants. Regular service, designed to bring a factory or premises to a high degree of efficiency in the use of fuel and to maintain it at that level. Checks on space-heating systems and advice on insulation. Advice on the Clean Air Act requirements and the reduction of smoke and grit emission. N.I.F.E.S. uses equipment specially designed by the British Coal Utilization Research Association as a basis for advice in grit emission cases. It is also used to test the operation and efficiency of grit arrestors which, under the Clean Air Act, are required to be properly maintained and used. A comprehensive series of training and refresher courses for boiler plant operators, works and plant engineers, and all those whose work is connected with fuel and steam-using plant. For the benefit of those who are unable to attend technical colleges, N.I.F.E.S. has a specially designed study course, leading to the City and Guilds of London Boiler Operator's Certificate.

All enquiries should be addressed to the appropriate Area Engineer at the address given in the Directory.

British Standards relating to Air Pollution

B.S.		
758 :	——	Small domestic hot-water supply boilers using solid fuel 758: Part 1: 1955 Manually-controlled boilers 1958: Part 2: 1960 Thermostat-controlled boilers
893 :	——	Method of testing dust extraction plant and the emission of solids from chimneys of electric power stations
1251 :	——	Open fireplace components 1251: Part 1: 1959 Firebacks for use with inset open fires 1251: Part 2: 1959 Fireplace surrounds and hearths 1251: Part 3: 1959 Adjustable chimney-throat restrictors (insertible) 1251: Part 4: 1960 Lintels
1252 :	1957	Domestic solid fuel cookers with integral boilers
1304 :	1956	'Ready-to-fit' thermal insulating materials
1747 :	——	Methods for the measurements of air pollution 1747: Part 1: 1961 Deposit gauges 1747: Part 3: 1963 Determination of sulphur dioxide 1747: Part 4: 1963 The Lead Dioxide Method
1756 :	——	Methods for the sampling and analysis of flue gases 1756: Part 1: 1963 Methods of sampling 1756: Part 2: 1963 Analysis by the Orsat apparatus
2740 :	1956	Simple smoke alarms and alarm metering devices
2741 :	1957	Recommendations for the construction of simple smoke viewers
2742 :	1958	Notes on the use of the Ringelmann Chart 2742 C: 1957 Ringelmann Chart 2742 M: 1960 Miniature smoke chart
2811 :	1957	Smoke density indicators and recorders
2845 :	——	Coke-burning inset open fires without boiler and without convection 2845: Part 1: 1957 Dimensional and constructional requirements 2845: Part 2: 1959 Performance and constructional requirements
2978 :	——	Measurements of smoke emission from industrial boilers 2978: Part 1: 1958 Medium capacity coal-fired water-tube

	boilers with travelling grates
	2978: Part 2: 1961 Coal-fired shell boilers with various types of mechanical stokers
3107 : 1959	Small incinerators for the destruction of hospital dressings
3128 : ——	Constructional and performance requirements for inset open fires with boiler and without convection
3142 : ——	Manufactured solid smokeless fuels for household use
	3142: Part 1: 1959 Cokes for domestic open fires
3250 : ——	Thermal testing of domestic solid fuel burning appliances with convection
	3250: Part 1: 1960 Flue loss method
	3250: Part 2: 1961 Hood method
3316 : 1960	Large incinerators for the destruction of hospital waste
3328 : 1961	Domestic gas pokers and portable underbar ignition burners
3376 : 1961	Open fire with convection, with or without boiler
3377 : 1961	Back boilers for domestic solid fuel appliances
3378 : 1961	Domestic heating stoves using coke and other solid fuels
3405 : 1961	Simplified methods of measurement of grit and dust emission from chimneys

All the above Standards are obtainable direct from the British Standards Institution at British Standards House, 2 Park Street, London, W.1.

Solid Smokeless Fuels

Some 30,000,000 tons of solid smokeless fuels are used annually in this country all based on coal from the mines. All the solid smokeless fuels are made for a specific purpose and differ in their bulk density, their reactivity and their volatile content according to the class and quality of coal from which they are made, the plant in which the coal is carbonized and the conditions of carbonization. Very great care is taken in the manufacturing of these fuels to ensure their suitability for the purpose they were made and for the particular types of appliances for which they were produced.

Very few people now believe that solid smokeless fuels are coal with the goodness taken out but realize they are in fact coal with the smoke taken out, and that in actual fact these fuels when burned in the approved appliance will give one-third more heat per lb than the coal from which they were originally made. All these fuels are graded and sized before being sold to ensure satisfaction.

Solid smokeless fuels fall into two groups, the natural fuels and the manufactured fuels as follows:

NATURAL FUELS

Anthracite

Anthracite is obtained mainly from South Wales and is characterized by its hard and bright appearance and is distinguished by its high carbon and low volatile content. It is a suitable fuel for room heaters, boilers and cookers in which it will burn for many hours without attention.

The small sizes of anthracite, peas, beans or grains, are used on gravity feed central heating boilers.

Welsh Dry Steam Coal

Welsh Dry Steam Coal differs slightly from anthracite from visual inspection. It can be distinguished by its relatively high carbon content although the volatile content is slightly higher. It is suitable for use in room heaters, boilers and cookers.

Low Volatile Steam Coal

Low volatile steam coal is a solid fuel suitable for all types of open fires. It has a higher volatile content than Welsh Dry Steam Coal, has a high bulk density and the replenishment of the fire is not so frequent as with lighter fuels.

MANUFACTURED FUELS

Premium Fuels

These reactive fuels or as they have become known, the premium fuels, have been developed to meet the demand for smokeless fuels suitable for the open fire that are easy to light and burn with a flame. In general these fuels will burn in old fashioned grates and can be ignited in the conventional way but they will burn more efficiently in modern approved open fires fitted with gas ignition. The fuels in this category are:

Cleanglow and Phimax

These fuels are produced by different Area Gas Boards in continuous vertical retorts from specially selected coals. Cleanglow is available in most parts of the country although Phimax is only available in the North West.

Coalite and Rexco

Coalite and Rexco are manufactured from two different low temperature carbonization processes. The coal is carbonized at a lower temperature than other fuels for a shorter period to ensure a reactive fuel.

Smaller sizes of these fuels are suitable for room heaters, cookers and boilers.

Barnsley Burnbrite

This fuel is manufactured in coke ovens from a specially selected and prepared coal at a lower temperature and for a shorter period than other products from coke ovens, and is suitable for the approved open fire.

Smaller sizes of this fuel can be burned on room heaters, cookers and boilers.

Barnsley Burnbrite is available in parts of London, the Midlands, the North West and South Yorkshire.

Homefire

Homefire, a premium fuel, is a six sided briquette approximately 3 in. in diameter and 1¼ in. thick. This regular shaped fuel has much the density and appearance of coal. It will burn with a long cheery flame without smoke in any type of open fire and holds its shape as it burns away completely leaving very little ash. Production at present is restricted to the pilot plant at Birch Coppice and at the present time is sold in certain parts of the Midlands, the North West of England and North West London.

Gloco and Sebrite

These fuels are produced by the carbonization of selected coals and are carefully prepared for use in open fires which are specified for use with coke and preferably fitted with gas ignition. These fuels will not burn in old fashioned grates. Continuous vertical retort gas coke also comes within this category and is available in most parts of the country. These fuels are practically all carbon and burn with a higher emission of heat than the coals from which they were made.

Smaller sizes of these fuels are also suitable for room heaters, cookers and boilers.

Sebrite is supplied only in the South East of England.

Phurnacite

Phurnacite is carbonized ovoids made from specially selected and prepared Welsh Dry Steam Coals. Most of the volatile content is removed during the manufacturing process. The resulting smokeless ovoids burn for long periods without attention, are completely free of stone or shale and are suitable for use in stoves, boilers and cookers. The ovoids are extremely hard so that breakage and the formation of "fines" during transit is unlikely.

Sunbrite

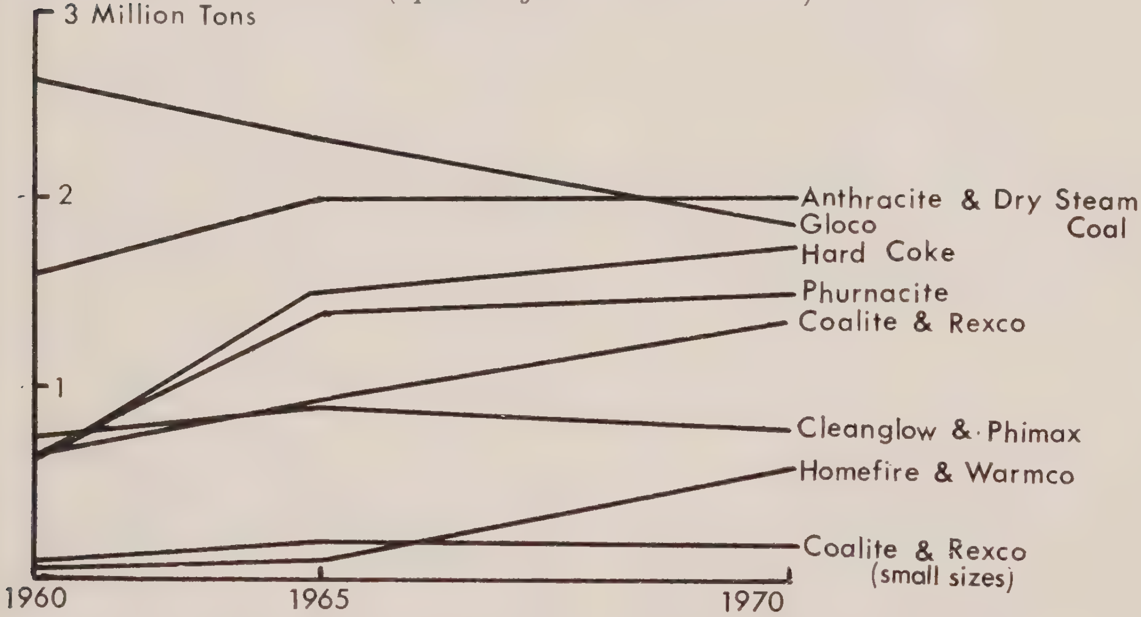
Sunbrite is a hard coke produced by the carbonization of selected coals at high temperature in coke ovens. It is carefully prepared and selected for domestic heating appliances and is suitable for room heaters, boilers and cookers in which it will burn for many hours without attention. It is also suitable for fires with under-floor primary air for combustion but not for other open fires.

It is possible that other fuels will be available on the domestic market sometime in the future as additional research is taking place within the National Coal Board to develop new fuels suitable for use in room heaters and boilers.

Domestic Fuel Supplies

Figures from the Ministry of Power's White Paper, expressed graphically

(*reproduced from "Smokeless Air"*)



Production estimates to 1970 of named solid smokeless fuels

The Clean Air Case

A Synopsis for the Guidance of Speakers, Writers, Teachers, etc.

1. Historical Background. Growth of the air pollution problem and efforts to abate it, from 1273 to the present day. (*See History table.*)

2. Nature, Sources and Causes, Smoke: Due to incomplete combustion; consists of fine carbonaceous particles and tarry droplets. (For quantities produced, *see Table.*) Note that combustible gases escaping when smoke is produced bring the total fuel losses to an equivalent of nearly 10 million tons of coal a year.

Gases: Sulphur dioxide the most harmful, especially when in association with smoke particles. Also carbon monoxide, and noxious gases and fumes from chemical processes.

Grit and dust: Mainly from industrial sources, e.g., pulverized coal and high-draught furnaces.

3. Extent and Behaviour of Pollution. Measurement of floating and deposited impurities, sulphur dioxide, and of light values. The Investigation under the Fuel Research Station, D.S.I.R. (*q.v.*)

4. Fog. Natural and smoke fogs, their formation and characteristics. The London, 1952, 1962, and other lethal smogs.

5. Effects. *Health:* Effects on respiratory system. Effects due to obstruction of natural light. Possible relationship with lung cancer. Psychological and social consequences of life in smoke-ridden environment. Effects of smog are the result of infrequent high concentration of pollution, whereas the insidious action of " normal " pollution takes place continuously.

Plant Life: Principal factors injurious to vegetation are: loss of sunlight, blocking of stomata by deposits, direct attack by chemicals, acidification of soil. Indirect effect on grazing animals through deterioration of herbage, or of poisoning in the case of fluoride pollution.

Materials: Corrosion or erosion of metals, stone, fabrics, leather, etc.

Visibility: Loss of visibility due to smoke haze and smog affecting air and surface transport.

Costs: See information on page 29

6. Prevention. *Industrial Smoke:* calls for correct equipment, maintenance and operation of plant. Value of mechanical stoking. Uses of oil, gas, electricity and smokeless solid fuel. Importance of training and certification of stokers. Instrumentation, smoke alarms, etc. Need for all-round fuel efficiency. *Dust and grit:* Use of arrestors of appropriate types: cyclones, wet washing, electrostatic precipitators. *Sulphur:* removal by coal washing, flue gas-washing and other possible means.

Domestic: By use of smokeless fuels—gas, electricity, oil or solid. *See article describing the types of solid smokeless fuel.* Need for efficient appliances. Central and district heating, whole-house warming, off-peak electrical methods, etc. Smoke control areas, purpose and national programme.

Railways and Roads: Use of diesels and electricity for the former. Need for efficient combustion and good maintenance in road vehicles, possible development of catalytic afterburners and other devices.

7. Policy, Law, etc. The present law —Clean Air Act, 1956, Public Health Act, 1936, local Acts, Road Traffic Act, 1930, Alkali, etc., Works Regulation Act, 1906, and Orders, etc. The Beaver Report and its proposals (*q.v.*). Responsibilities of local authorities and central Government. Smokeless zones and smoke control areas. Work of the D.S.I.R., Alkali Inspectorate and other organizations. Educational and publicity work of the National Society for Clean Air.

Major Smog Disasters

The word " smog " was first used by the late Dr. H. A. Des Vœux, founder-president of the N.S.A.S., in 1905, to denote the combination of smoke and natural fog that in urban areas may have disastrous consequences. There are numerous cases of smog conditions resulting in a marked rise in mortality and morbidity from respiratory disorders and consequential cardiac failure. Among these incidents are the following.

London, 1873. Rise in bronchitis deaths, compared with the previous week, of 268.

London, 1880. Rise in bronchitis deaths, compared with the previous week, of 692.

London, 1891. Rise in bronchitis deaths, compared with the previous week, of 572.

Glasgow, 1909. Average number of deaths in the 3 weeks prior to the fog were 57 per week. During 5 weeks of fog or haze the deaths per week were: 138, 233, 171, 198 and 137.

Manchester and Salford, 1930-31. In December, with no fog, there were 137 respiratory disease deaths. In January there were 9 days heavy fog and 592 deaths.

Meuse Valley, 1930. 60 deaths attributed to fog, the death rate rising to 10·5 times the normal. Many cattle had to be slaughtered.

London, 1948. Bronchitis deaths in week before fog, 73; in the week of fog, 148.

Donora, U.S.A., 1948. 18 deaths in a population of 14,000. 42 per cent of the population were estimated to have suffered from illness.

London, 1952. The fog developed on Friday, 5th December and continued until 8th December. Estimated total of 4,000 deaths in the Greater London area. In the Administrative County only deaths from bronchitis rose from 121 to 872, and from heart and circulatory diseases, from 318 to 801.

London, 1956. 1,000 additional deaths attributed to January fog in the Greater London area. (*B.M.J.*, 31 *March*, 1956.)

London, 1962—Fog in London and other areas, December 3-7, with similarities to the 1952 fog, but with 750 additional deaths as compared with 4,000.

Principal References

Mortality and Morbidity during the London Fog of December, 1952. Ministry of Health Public Health Report No. 95. (This report contains a section on " Previous Fog Incidents," with a statistical appendix for those in London.)

Les Problèmes de Pollution de l'Atmosphère, Batta, Firket and Leclerc, Liége, 1937.

Air Pollution in Donora, Pa. Public Health Bulletin, No. 306, Federal Security Agency, Public Health Service, Washington.

The History of Air Pollution in Great Britain

A Chronological Table

1273	Use of coal prohibited in London as being " prejudicial to health."
1306	Royal Proclamation prohibiting artificers from using sea-coal in their furnaces. Record of the execution of one offender.
1307	Commission of Inquiry appointed to " inquire of all such who burnt sea-coal in the city or parts adjoining, and to punish them for the first offence with great fines and ransoms, and upon the second offence to demolish their furnaces."
1578	Queen Elizabeth I " findeth herself greately greved and anoyed with the taste and smoke of the sea-cooles."
1648	Petition of Londoners to Parliament to prohibit the importation of coal from Newcastle on account of the injury they experienced.
1661	John Evelyn submitted his " Fumifugium, or the Smoake of London Dissipated," to Charles II.
1819	Committee appointed by Parliament to inquire how far persons using steam engines and furnaces could erect them in a manner less prejudicial to public health and comfort.
1843	A Select Committee recommended the introduction of a Bill dealing with nuisances from furnaces and steam engines.
1845	Another Select Committee reported that it was not desirable to extend the provisions of an Act beyond furnaces used for steam generation.
1847	The Town Improvement Clauses Act contained a section dealing with factory smoke.
1853-6	Smoke Abatement Acts relating to the Metropolitan area.
1866	The Sanitary Act empowered sanitary authorities to take action in cases of smoke nuisances.
1875	The Public Health Act containing a smoke abatement section on which legislation to the present day has been based.
1881	Smoke Abatement Exhibition at South Kensington organized by the Public Health and Kyrle Societies.
1882	Formation of the National Smoke Abatement Institution.
1891	The Public Health (London) Act.
1899	Formation of the Coal Smoke Abatement Society, led by Sir William Richmond, R.A. and Dr. H. A. Des Vœux (concerned mainly with London).
1909	Sheffield smoke abatement Exhibition, at which was set up the Smoke Abatement League of Great Britain (mainly for the provinces and centred later in Manchester and Glasgow).
1912	International smoke abatement Exhibition in London, organized by the Coal Smoke Abatement Society, leading to the formation of a Committee for the Investigation of Atmospheric Pollution (now under the auspices of the D.S.I.R.).
1913	Smoke abatement Bill introduced in the House of Commons by A. G. C. Harvey, M.P.
1914	Smoke abatement Bill introduced in the House of Lords by Lord Newton. Withdrawn on the appointment of a Departmental Committee to investigate the problem.
1920	Committee re-formed after the war with Lord Newton as Chairman.
1921	Publication of the Final Report of the Newton Committee.
1926	Public Health (Smoke Abatement) Act by which the 1875 and 1891 Acts were amended and extended.
1927	Establishment of first regional committees of local authorities.
1929	Amalgamation of the Coal Smoke Abatement Society and Smoke Abatement League of Great Britain to form the National Smoke Abatement Society. First publication of a journal (now *Smokeless Air*) devoted to air pollution.

1936 Public Health Act, in which were included the provisions of the smoke abatement Act of 1926.

1946 Simon Report on Domestic Fuel Policy, recommending, *inter alia*, measures for domestic smoke prevention.

1946 First smokeless zone and prior approval legislation (Manchester Corporation Act).

1951 First smokeless zone established (in Coventry).

1952 Ridley Report on " Policy for the Use of Fuel and Power Resources," recommending, *inter alia*, measures for smoke prevention.

1952 London smog disaster, the most serious for many years, with a death roll of 4,000 (*q.v.*).

1953 Beaver Committee on Air Pollution set up by the Government and published an Interim Report.

1954 Final Report of the Beaver Committee.

1954 A Clean Air Bill introduced by Gerald Nabarro, M.P., and withdrawn (4th Feb., 1955) on Government undertaking to introduce their own Bill.

1955 Whole of City of London declared a smokeless zone.

1956 Clean Air Act.

1958 National Smoke Abatement Society became incorporated under new name of National Society for Clean Air.

1959 International Diamond Jubilee Clean Air Conference and Exhibition (NSCA), London.

1962 Smog episode in London and other cities. Estimated death roll of 750 in Greater London.

1962 Holborn M.B. first local authority in country to reach its final target under Clean Air Act and became second smokeless borough.

1963 Stoke Newington M.B. became third smokeless borough.

1963-4 Report on solid smokeless fuels supply and amendments to Clean Air Act in Housing Act, 1964, modifying smoke control area policy.

Recent Books, Papers and Reports

A Selected List

Industrial

99th Annual Report on Alkali etc., Works for 1962. Chief Inspectors, pp. 75 H.M.S.O. 1963. (5s.).

Mechanical Equipment for Removing Grit and Dust from Gases. Jackson, R. Brit. Coal Utilization Research Assoc., Leatherhead, Surrey, pp. 284 (50s.).

The Technical Background Leading to the Ministry's Memorandum on Chimney Heights. Ireland, F. E. (Smokeless Air, No. 127, Autumn 1963, 28-32).

The Removal of Sulphur Dioxide from Flue Gas. Reed, L. E. (Smokeless Air, No. 127, Autumn 1963, 44-45).

Conference on Control and Collection of Fumes from Steel Foundry Melting Furnaces. Proceedings publ. by British Steel Castings Research Association, East Bank Road, Sheffield 2. (20s.).

Industrial Electrostatic Precipitation. White, H. C. pp. 376, Pergamon Press, Oxford (94s. net).

Progress in a Heavy Chemical Industry. Britten, A. N. Nat. Soc. for Clean Air. Proc. Scarborough Conf. 1963. (20s.).

Technical Aspects and Means for Control of Grit and Dust. Clegg, L. and Short, W. Nat. Soc. for Clean Air. Proc. Scarborough Conf. 1963 (20s.).

Administrative Problems of Control of Grit and Dust. Sugden, F. G. Nat. Soc. for Clean Air. Proc. Scarborough Conf. 1963 (20s.).

Minimizing the Emission of Dust from Industrial Boiler Plants. Sharp, J. Journ. Inst. of Fuel, No. 274, Nov. 1963.

9th Progress Report. National Industrial Fuel Efficiency Service, for the Year ended March 31, 1963. pp. 43, N.I.F.E.S. London.

Fume Arrestment. Special Report No. 83, Iron & Steel Institute, London, 1964.

Industrial Pollution Falling. N.S.C.A.'s Inquiry. (Smokeless Air, No. 129, Spring 1964, 213-4).

Air Pollution Aspects of the Iron and Steel Industry. Schuenemann, J. J. et.

al. (Public Health Service Publ. No. 999—AP-1. U.S. Dept. of Health, Div. of Air Poll. Cincinnati 26, Ohio, June 1963).

Research and Investigation

Warren Spring Laboratory: Report for 1962. Dept. of Scientific and Industrial Research, pp. 28. H.M.S.O. (4s. net).

An Experimental Chimney for the Study of Dispersion of Gaseous Pollutants. Reed, L. E., Barrett, C. F. and Wallin, S. C. Nat. Soc. for Clean Air. Proc. Scarborough Conf. 1963 pp. 92-99 (20s.).

Developments in the Coal Industry Related to Clean Air. Taylor, A. Nat. Soc. for Clean Air. Proc. Scarborough Conf. 1963. (20s.)

The Search for Natural Gas and Underground Gas Storage. Johnson, C. Nat. Soc. for Clean Air. Proc. Scarborough Conf. 1963. (20s.).

Power Stations and Clean Air. Stone, G. N. and Clarke, A. J. Nat. Soc. for Clean Air. Proc. Scarborough Conf. 1963 (20s.).

The Application and Performance of Off-Peak Electrical Space-Heating in Buildings. Griffith, M. V. Nat. Soc. for Clean Air. Proc. Scarborough Conf. 1963 (20s.).

Effects of Air Pollution

Air Pollution—The Human Problem. Catterall, Dr. M. (Smokeless Air, No. 128, Winter 1963, 142-148).

A U.S. View of the Sulphur Problem. MacKenzie, V. A. (Smokeless Air, No. 127, Autumn 1963, 40-43).

Compliance with the Clean Air Act: Medical Aspects. Lawther, P. J. Journ. Inst. of Fuel. No. 271, August, 1963.

Chronic Respiratory Disease in Great Britain. McKerrow, C. B. (Arch. Env. Health, 1964, **8,** No. 1. 174-179).

Mortality from Lung Cancer and Bronchitis in Relation to Smoke and Sulphur Dioxide Concentration, Population Density and Social Index. Buck, S. F., and Brown, D. A. Research Papers No. 7, (Tobacco Research Council, 6-10 Bruton St, London W.1. 1964).

Domestic

Circular No. 69/63. Ministry of Housing & Local Government. "Smoke Control Areas" December 17, 1963. H.M.S.O. (1s. net).

A Survey of Smoke Control Areas. Report of an Inquiry by the Association of Public Health Inspectors. (Smokeless Air, No. 128, Winter 1963, 155-161).

Smoke Control Areas and their Problems. Bellingham, E. Nat. Soc. for Clean Air. Proc. Scarborough Conf. 1963.

Domestic Solid Smokeless Fuel Appliances: Pointers to Improved Design. Moss, W. C. Journ. Inst. of Fuel, No. 270, July 1963.

Domestic Heating. Rowse, R. H. Journ. Inst. of Fuel, No. 270, July 1963.

Fuel

Domestic Fuel Supplies and the Clean Air Policy. Min. of Power. Cmnd. 2231, Dec. 1963. H.M.S.O. (1s. 6d. net).

The Changing Scene in Gas. Redman, M. Journ. Inst. of Fuel, No. 271, August 1963.

Fuel Economy, 1964. Feder. Brit. Industr. pp. 156 (10s.).

General

The Control of Air Pollution. Gilpin, A. pp. 514, Butterworths, London (120s.).

The December Smog, 1962. Discussed at N.S.C.A. London Meeting. (Smokeless Air, No. 126, Summer 1963, 279-288).

Symposium: Air Over Cities. Report of a Conference sponsored by the Div. of Air Pollution, U.S. Dept. of Health, Education and Welfare, Washington D.C. (SEC Technical Report A62-5).

Presidential Address. Parker, Dr. A. Nat. Soc. for Clean Air. Proc. Scarborough Conf. 1963.

The Clean Air Act: A General Survey. Marsh, A. Journ. Inst. of Fuel, No. 269, June 1963.

Clean Air and Refuse Collection Memorandum from the N.S.C.A. (Smokeless Air. No. 129, Spring 1964).

Road Vehicles

Why Not Carless Zones? Marsh, A. (Smokeless Air, No. 127, Autumn 1963, 25-27).

Air Pollution from Road Vehicles. Wilford, A. T. (Smokeless Air, No. 126 Summer 1963, 289-294).

Pollution from Road Vehicles. Technical Committee Report. Nat. Soc. for Clean Air. Proc. Scarborough Conf. 1963 (20s.).

Guide to Publications

This list of available books, reports and pamphlets on smoke prevention, atmospheric pollution and fuel usage is issued by the National Society for Clean Air as a reference guide for readers. It may also be used for ordering the publications which may be obtained either direct from the Society, or other bookseller.

Prices in brackets include postage and packing, which must be included when ordering by post, except in the case of orders over £2, which will be sent post-free. If a number of items are ordered together excess postages will be refunded. Prices quoted are those current at the date of publication, and are subject to variation.

Information about older, out-of-print, and overseas publications may be obtained from the Society on request. Most of these are in the Society's library and can be consulted, or in some cases borrowed for short periods, by arrangement.

Except where otherwise stated the publisher is the Society. H.M.S.O.—H.M. Stationery Office. The publications are numbered and orders to the Society may be made by the code number.

Legislation

Acts and Memoranda

Code No.

82. **Clean Air Act, 1956.** The latest Statute governing smoke, containing sections on dark smoke, smoke from furnaces, grit and dust from furnaces, smoke control areas, smoke nuisances, special cases, clean air council and miscellaneous provisions. (H.M.S.O., 1956) 4 & 5 Eliz. 2 Ch.52. 2s. (2s. 4d.)

83. **Clean Air Act, 1956.** Memorandum on Smoke Control Areas. (H.M.S.O., 1956) 1s. 3d. (1s. 5d.)

84. **Clean Air Act, 1956.** Memorandum on Miscellaneous Provisions. (H.M.S.O., 1956) 8d. (10d.)

85. **Amendment to Model Byelaws.** Series IV Buildings (1953) Edition. (H.M.S.O., 1956) 2d. (4d.)

80. **The Clean Air Act, 1956.** A Descriptive Summary. (N.S.C.A.) 4s. 6d. per dozen, post free. 6d. single copy.

105. **Thermal Insulation (Industrial Buildings) Act, 1957.** (5 & 6 Eliz. 2 Ch.40). (H.M.S.O., 1957) 6d. (8d.)

118. **Clean Air Act, 1956. Memorandum on Industrial Provisions.** (H.M.S.O., 1958) 1s. (1s. 3d.)

125. **Clean Air Act, 1956. Memorandum on Industrial Provisions (Scotland).** (H.M.S.O., 1959) 1s. (1s. 3d.)

187. **Clean Air Act, 1956. Memorandum on Chimney Heights.** (H.M.S.O., 1963) 1s. 3d. (1s. 6d.)

Regulations (Statutory Instruments)

86. **Clean Air: The Smoke Control Areas (Authorized Fuels) Regulations, 1956.** Statutory Instruments, 1956 No. 2023. (H.M.S.O., 1956) 2d. (4d.)

103. **Motor Vehicles (Construction and Use) (Amendment) Regulations, 1957.** Statutory Instruments No. 359, 1957. (H.M.S.O.) 6d. (8d.)

104. **Clean Air Council Order, 1957.** Statutory Instruments No. 766, 1957. (H.M.S.O.) 3d. (5d.)

113. **Smoke Control Areas (Exempted Fireplaces) Order, 1957.** S.I. No. 541, 1957. (H.M.S.O.) 2d. (4d.)

115. **Alkali, etc., Works Order, 1958.** S.I. No. 497, 1958. (H.M.S.O.) 3d. (5d.)

117. **Dark Smoke (Permitted Periods) Regulations, 1958.** S.I. No. 498, 1958. 3d. (5d.)

119. **Dark Smoke (Permitted Periods) (Vessels) Regulations, 1958.** S.I. No. 878, 1958. (H.M.S.O.) 3d. (5d.)

120. **Clean Air Act, 1956 (Appointed Day No. 2) (Scotland) Order, 1958.** S.I. No. 1931, 1958. (H.M.S.O.) 2d. (4d.)

121. **Alkali, etc., Works (Scotland) Order, 1958.** S.I. No. 1932, 1958. (H.M.S.O.) 3d. (5d.)

122. **Dark Smoke (Permitted Periods) (Scotland) Regulations, 1958.** S.I. No. 1933, 1958. (H.M.S.O.) 3d. (5d.)

123. **Dark Smoke (Permitted Periods) (Vessels) (Scotland) Regulations, 1958.** S.I. No. 1934, 1958. (H.M.S.O.) 3d. (5d.)

137. **Smoke Control Areas (Exempted Fireplaces) Order, 1959.** S.I. No. 1207, 1959. (H.M.S.O.) 3d. (5d.)

139. **Smoke Control Areas (Exempted Fireplaces) (Scotland) Order, 1959.** S.I. No. 2264 (S.123), 1959. (H.M.S.O.) 3d. (5d.)

173. **Motor Vehicles (Construction and Use) (Amendment) Regulations, 1961.** S.I. No. 1313, 1961 (H.M.S.O.) 3d. (5d.)

174. **Alkali, etc., Works Order, 1961.** S.I. No. 2261, 1961. (H.M.S.O.) 3d. (5d.)

176. **Alkali, etc., Works Order, 1963.** S.I. No. 493, 1963. (H.M.S.O.) 5d. (7d.)

191. **Clean Air: The Smoke Control Areas (Authorized Fuels) Regulations 1963.** S.I. No. 1275, 1963. (H.M.S.O., 1963) 3d. (5d.)

Circulars

124. **Smoke Control Areas.** Circular No. 5/59 (26/1/1959). (H.M.S.O.) 6d. (8d.)

138. **Exempted Fireplaces Order, 1959.** Circular No. 44/59 (16/7/1959). (H.M.S.O.) 3d. (5d.)

164. **Use of Sticks and Paper in Smoke Control Areas.** Circular No. 28/60 (7/7/60). (H.M.S.O.) 3d. (5d.)

166. **Notification of Provisional Plans for establishing Smoke Control Areas.** Circular No. 1/61 (16/1/1961) (H.M.S.O.) 3d. (5d.)

167. **Air Pollution—Measurement and Research.** Circular No. 12/61 (10/4/1961) (H.M.S.O.) 3d. (5d.)

168. **Selection of Open Fires for Coke Burning.** Circular No. 28/61 (5/6/1961) (H.M.S.O.) 3d. (5d.)

169. **Works of Adaptation Eligible for Grant.** Circular No. 31/61 (26/6/1961) (H.M.S.O.) 3d. (5d.)

170. **Industrial Furnaces.** Circular No. 42/61 (29/8/1961) (H.M.S.O.) 2d. (4d.)

171. **Smoke Control in the Black Areas.** Circular No. 4/62 (30/1/1962) (H.M.S.O.) 5d. (7d.)

172. **Smoke Control Areas.** Circular No. 3/62 (30/1/1962) (H.M.S.O.) 1s. (1s. 3d.)

177. **Alkali, etc., Works Regulation Act, 1906.** Circular No. 23/63 (22/3/63) (H.M.S.O.)

178. **"Homes for Today and Tomorrow".** Circular No. 13/62 (H.M.S.O.) (12/2/62) 3d. (5d.)

179. **Fuel Storage in New Local Authority Housing.** Circular No. 50/62 (1/10/62) (H.M.S.O.) 3d. (5d.)

180. **Smoke Control Programmes, 1962-1966.** Circular No. 60/62. (18/12/62) (H.M.S.O.) 3d. (5d.)

181. **Gas Cokes as Open Fire Fuels.** Circular No. 7/63 (2/4/63) (H.M.S.O.) (8d.)

188. **Chimney Heights.** Circular No. 25/63 (15/5/63) (H.M.S.O.) 3d. (5d.)

190. **Smoke Control Areas.** Circular No. 69/63. (17/12/63) (H.M.S.O.) 1s. (1s. 3d.)

Other Government Publications

58. **Committee on Air Pollution.** The Interim Report of the Beaver Committee appointed in July, 1953, to examine the nature, causes and effects of air pollution and the efficiency of present preventive measures; to consider what further preventive measures are practicable; and to make recommendations. (Cmd. 9011.) (H.M.S.O., 1953.) 2s. 6d. (2s. 9d.)

71. **Committee on Air Pollution.** The Final Report of the Beaver Committee. (Cmd. 9322). (H.M.S.O., 1954.) 4s. 6d. (4s. 9d.)

92. **Mortality and Morbidity During the London Fog of December, 1952.** Ministry of Health, Reports on Public Health and Medical Subjects, No. 95. (H.M.S.O., 1954.) 2s. 6d. (2s. 10d.)

132. **The Efficient Use of Fuel.** (H.M.S.O., for Ministry of Power). 35s. (37s.)

44. **Housing Manual, 1949.** The official recommendations on housing practice. The section on the heat installa-

tion may be regarded as the basis of present-day smoke prevention policy. (H.M.S.O., 1949)

155. **Report of the Committee on Solid Smokeless Fuels.** (Cmd. 999, H.M.S.O., 1960). 1s. 3d. (1s. 6d.)

26. **Atmospheric Pollution in Leicester.** Report of the important scientific survey of the behaviour of pollution in the atmosphere. Atmospheric Pollution Research Technical Paper No. 1. (H.M.S.O., 1945.) 6s. (6s. 7d.)

The Investigation of Atmospheric Pollution. Reports by the Fuel Research or Warren Spring organization of the Department of Scientific and Industrial Research, co-ordinating local observations of atmospheric pollution.

75. **27th Report (1944-54).** (H.M.S.O., 1955.) 7s. 6d. (8s. 2d.)

106. **28th Report (1954-55).** (H.M.S.O., 1957.) 5s. 6d. (6s. 1d.)

134. **29th Report (1955-56).** (H.M.S.O., 1958.) 7s. (7s. 8d.)

135. **30th Report (1956-57).** (H.M.S.O., 1959). 7s. 6d. (8s. 2d.)

57. **31st Report (1957-58).** (H.M.S.O., 1960.) 8s. (8s. 10d.)

111. **Measurement of Air Pollution.** Recommended Methods for deposited matter, smoke and sulphur dioxide. Fuel Research Station. Department of Scientific and Industrial Research. (H.M.S.O., 1957.) 2s. (2s. 3d.)

163. **Annual Report on Alkali, etc. Works, 1960.** 97th Report. (H.M.S.O.) 4s. (4s. 4d.)

182. **Smoke Control (England and Wales) 1962-1966.** Summary of programmes of local authorities for establishment of Smoke Control Areas. (Cmnd. 1890, H.M.S.O.) 3s. 6d. (4s.)

189. **Domestic Fuel Supplies and the Clean Air Policy.** (Presented to Parliament by the Minister of Power, December, 1963). (Cmnd. 2231, H.M.S.O.) 1s. 6d. (1s. 9d.)

General

11. **Smoke: The Problem of Coal and the Atmosphere.** Arnold Marsh. A comprehensive textbook on the causes, consequences and means for prevention of smoke. Illustrations and bibliography. (Faber and Faber Ltd., 1947.) 21s. (21s. 9d.)

13. **Smokeless Air.** The Society's quarterly magazine-type journal. News, articles, photographs, comment. 10s. per annum, post free, 2s. 6d. (2s. 11d.)

53. **Atmospheric Pollution: Its Origins and Prevention.** A. R. Meetham. Fully illustrated. (Pergamon Press Ltd., 1952.) 2nd Edition, 1956. 63s.

131. **Air Pollution.** Ed. M. W. Thring. (Butterworths.) 42s. (43s.)

141. **Air Pollution Control.** W. L. Faith. (Chapman and Hall, 1959.) 68s. (69s.)

15. **Fumifugium or the Smoake of London Dissipated.** John Evelyn. The famous diarist's well-known tract (1661) reprinted by the Society. Special tercentenary issue. Cloth bound 5s. (5s. 6d.). Paper back 2s. 6d. (2s. 9d.).

142. **New Stoker's Manual.** (National Industrial Fuel Efficiency Service.) 2s. 6d. (2s. 10d.)

183. **Air Pollution.** Edited by Arthur G. Stern. In 2 vols., pp. 656 and 586. Academic Press, New York and London. Vol. 1 (143s.). Vol. 2. (132s.).

193. **Smoke Inspector's Handbook** by A. Coe and I. M. Coe, from Clean Air Information Service, The College of Fuel Technology, 90 Talbot Road, London, N.6. Volume 1: 35s.; Volume 2: 42s.

194. **The Control of Air Pollution.** Alan Gilpin. pp. 514. Royal 8vo. London, Butterworths. 120s.

Conference Proceedings

(Details of earlier Conference Proceedings available on request)

61. **Glasgow Conference, 1953.** The Des Vœux Memorial Lecture—"Atmospheric Pollution in Relation to Preventive Medicine," and papers on the London Fog Disaster, Smokeless Zones, Production, Use and Availability of Solid Smokeless Fuels and the Efficient and Smokeless Combustion of Fuel Oils. 7s. 6d. (7s. 9d.)

70. **Scarborough Conference, 1954.** The Des Vœux Memorial Lecture—

"Air Pollution and Plant Life," Address by Sir Hugh Beaver, Presidential Address: "The Coal Crisis and the Society," papers on Rail Transport and Smoke Abatement, the Industrial Uses of Gas and the Industrial Uses of Electricity. 7s. 6d. (7s. 10d.)

87. **Southport Conference, 1956.** The Des Vœux Memorial Lecture—"Clean Air: The Next Chapter," Presidential Address, Progress Reports, Local Authorities and the Clean Air Act, Clean Air and the Housewife. 12s. 6d. (12s. 9d.)

98. **Hastings Conference, 1957.** The Des Vœux Memorial Lecture—"Meteorology and Air Pollution," Address by the Minister of Power, Lord Mills, Presidential Address, and papers on the Administration of the Clean Air Act, Industry and the Clean Air Act, and Pollution from Road Vehicles. 12s. 6d. (12s. 11d.)

126. **Llandudno Conference, 1958.** The Des Vœux Memorial Lecture—"Clean Air, Urban Amenity, and the Growth of Towns," Address by the Minister of Housing and Local Government, Presidential Address, Industrial Aspects of the Clean Air Act, Forum on Smoke Control Areas, and papers on Air Pollution in London and its Smokeless Zones, Air Pollution and Respiratory Disease, Hazards from Airborne Radioactive Matter, and An Automatic Stoker for Central Heating 12s. 6d. (12s. 11d.)

140. **London, 1959: Diamond Jubilee International Clean Air Conference.** Containing Opening Address by Sir Graham Sutton, F.R.S.; 78 Papers on National Air Pollution Problems, Legislation, Education; Technical Problems; Observations, Investigation and Measurement; Research and International Co-operation; Discussions and Authors' Replies. 30s. (32s. 6d.). (Reprints available of some of the Papers).

144. **Harrogate Conference, 1960.** The Des Vœux Memorial Lecture—"Clean Air, Public Opinion and the Press," Address by Parliamentary Secretary, Ministry of Housing and Local Government, Series of progress reports on (1) Research and Investigation; (2) Domestic Heating; (3) Industrial Problems, Papers on Air Pollution from Road Vehicles, and an Inquiry into the Working of the Clean Air Act. 25s. (25s. 7d.)

175. **Brighton Conference, 1961.** Opening Address by John C. George, Parliamentary Secretary, Ministry of Power. Presidential Address by Lord Cohen of Birkenhead. Reports on National Survey of Air Pollution, Furnace Operators Bill, Diesel Smoke; Papers on Industrial Aspects of the Clean Air Act, Whole House Heating, Smoke Control Areas and Transatlantic Discussion. 15s. (15s. 6d.)

184. **Harrogate Conference, 1962.** Presidential Address by Lord Cohen of Birkenhead. Three technical papers on pollution control in the steel industry, at coking plants and from iron foundry cupolas; International Session; the 1958 Alkali Order Processes; Domestic Smoke "Questions and Answers"; Incineration and Waste Disposal. 15s. (15s. 6d.)

192. **Scarborough Conference, 1963.** Opening Address by the Rt. Hon. Lord Hastings, Joint Parliamentary Secretary, Ministry of Housing and Local Government. Presidential Address by Dr. Albert Parker. Two papers on smoke control; Air Pollution—The Human Problem; Technical Committee Report on pollution from road vehicles; two papers on industry and the Clean Air Act; five reports on research and development; two technical papers on grit and dust emission. 20s. (20s. 10d.)

Reprints:

Des Vœux Memorial Lectures

45. **Towards the Better Use of Coal.** Dr. D. T. A. Townend, 1950. 2s. 6d. (2s. 9d.)

77. **Air Pollution and Plant Life.** Sir Edward Salisbury, 1954. Preprints only. 6d.

78. **The Destructive Effects of Air Pollution on Materials.** Dr. A. Parker. 1955. 1s. (1s. 3d.)

90. **Clean Air: The Next Chapter.** Sir Hugh Beaver, 1956. 1s. (1s. 3d.)

102. **Meteorology and Air Pollution.** Sir Graham Sutton, 1957. 1s. (1s. 3d.)

130. **Clean Air, Urban Amenity and the Growth of Towns.** Sir William Holford, 1958. 1s. (1s. 3d.)

152. **Clean Air, Public Opinion and the Press.** Sir Linton Andrews, 1960. 1s. (1s. 3d.)

Other Reprints

145. **Some factors concerning Diesel Engine Exhaust Fumes.** J. K. Lock, 1960. 1s. (1s. 3d.)

146. **Methods of Removing Smoke from Road Vehicles.** L. E. Reed and S. C. Wallin, 1960 1s. (1s. 3d.)

147. **Sampling for 3:4 Benzpyrene in Flue Gas from Plant fired by Petroleum Fuels.** E. L. Howe, 1960. 1s. (1s. 3d.)

148. **Trends in the Pollution of the Air of Gt. Britain, 1952-59.** J. Carroll, S. R. Craxford, H. E. Newall, P. M. Weatherley, 1960. 1s. 3d. (1s. 6d.)

149. **Pollution Levels in Cities.** F. P. Williams, 1960. 1s. (1s. 3d.)

150. **Accuracy and Reliability of Instruments in Common Use for Measurement of Air Pollution.** S. R. Craxford, E. T. Wilkins, D. W. Slimming, 1960. 1s. (1s. 3d.)

151. **Reports on an Inquiry into the Working of the Clean Air Act, 1960.** 2s. 6d.

165. **Air Pollution from Road Vehicles.** Reprint of Papers and Discussions, 1960. 3s. (3s. 3d.)

185. **Mitigation of Air Pollution at Coking Plants.** R. L. Cooper and J. P. Graham, 1962. 1s. (1s. 3d.)

186. **Incineration and Waste Disposal.** S. Cayton, 1962. 1s. (1s. 3d.)

Miscellaneous

93. **Ringelmann Smoke Chart** (with instructional leaflet). Chart for measuring smoke density. (Charles Griffin & Co. Ltd.)
1s. 2d. each, 3 for 2s. 6d., 6 for 4s. 2d., 12 for 7s. 2d., including postage.

112. **'Power's' Microringelmann.** Direct facsimile reduction of the standard Ringelmann Chart (McGraw-Hill, 1954.)
Single copies, 2s. 6d. (2s. 9d.)
27s. 6d. per dozen, post free.

Films and Filmstrips

Following is a list of films and filmstrips on air pollution and its prevention, fuel efficiency, etc. Application for the loan of the films (or purchase of the filmstrips) should be made to the issuing organization, referred to in the list by its initials, the key to which is given at the end of the list. Most of the films are available free, but the question of charges should be settled with the issuing organization, to whom 2-3 weeks advance notice of hire should be given. The running time in minutes is shown. Unless otherwise indicated, the films are available in both 16 and 35 mm. sizes, with sound.

Information of other films suitable for inclusion in future editions will be welcomed.

Films

GENERAL AND EDUCATIONAL

Guilty Chimneys (Revised). Present problem of air pollution and steps being taken to overcome it. 19 mins. G.C. and C.F.I.L.

Family Album. The problems of domestic life confronting successive generations of a middle-class family. 30 mins. G.C.

The Future is Electric. The place of nuclear power in smoke abatement. 28 mins. E.D.A.

Facts and Fancies. Deals with the value of the by-products of coal. 17 mins. G.C.

The A.B.C. of Gas. An animated cartoon designed for the younger age groups, showing the evolution of coal from the prehistoric forests to its modern conversion into gas, coke and other products. 9 mins. G.C.

The First Mile Up. The experience of cities in North America making vigorous efforts to combat air pollution. Smoke prevention in Toronto. Particularly well illustrated. 16 mm. 28 mins. N.F.B.C.

DOMESTIC AND SMOKE CONTROL AREAS

The Stockton Test. An account of the conversion of four sub-standard houses to modern standards of heating, etc. 20 mins. A.I.L.

Smokeless Fuel Conversions. How the Gas Industry can assist in the conversion of old-fashioned grates. 10 mins. G.C.

All Lit Up. Cartoon showing the advantages of the gas poker. 6 mins. G.C. (In colour).

Window to the Sky. Excellent colour film, showing technique of setting up smoke control area. Suitable for general publicity, and for showing to members of local authorities. 22 mins. G.C.

Clean Air. Colour film dealing with air pollution and showing how modern methods of domestic heating meet the requirements of the Clean Air Act. 22 mins. S-M & BP.

Arthur Clears the Air. A film in colour intended for showing at meetings where the Clean Air Act and Smokeless Zones are discussed. 27 mins. N.C.B.

French Architecture and Modern Heating. Modern solid fuel heating systems in a wide range of applications to buildings all over France are featured in this colour film which has been adapted in English by the N.C.B. Film Unit. 27 mins. N.C.B.

People Like Us. An amusing colour film about solid fuel home-heating. N.C.B.

Heating Research for Houses. A record of the important research experiment at Abbots Langley, Herts., into ways of heating houses. 28 mins. C.F.L.

Report from America: Smog. Concerted action by the inhabitants of Pittsburgh, Pennsylvania, at one time gravely affected by industrial and domestic air pollution, has eventually rid the city of lethal "smog" and ensured a pure atmosphere. This film gives an account of their campaign. 30 mins. C.F.L.

Housewarming. "The Bartons" decide to install solid smokeless fuel central heating. 17 mins. N.C.B. (In colour).

FUEL, POWER AND INDUSTRIAL

Fluidized Coal Carbonization and Hot Briquetting. To provide sufficient smokeless fuels to meet the increasing demand, the N.C.B. Coal Research Establishment has developed a new smokeless fuel. 12 mins. N.C.B.

Homefire. Smokeless fuel for the open fire. Based on small-sized smoky coal the new smokeless fuel is now in quantity production at Birch Coppice. The manufacture of the briquettes is explained non-technically. 12 mins. N.C.B. (In colour).

Using the Coal. Shows various uses of coal, and its place among modern sources of energy. 37 mins. 16 mm. only. N.C.B.

Mechanical Firing of Coal. A group of six colour films presenting the main types of mechanical stoker. Total length 60 mins. N.C.B.

Coal: Our Wasting Asset. This film deals with fuel efficiency, fuel conservation and the problem of smoke. 10 mins. N.C.B.

New King Coke. Colour film on coke and its uses, especially as a smokeless fuel. 20 mins. G.C.

Fire Without Smoke. Story of the development of the F.R.S. Fire Door. 20 mins. 16 mm. only. C.F.L.

Boiler House Practice (1). 26 mins. C.F.L.

Steam (2). 21 mins. C.F.L.

Furnace Practice (3). 30 mins. C.F.L.

CO_2 and Draught (4). 21 mins. C.F.L. Technical films, mainly for engineers and plant managers, but (2) is suitable for general factory workers, and (4) is especially suitable for showing to boiler firemen in training.

Oil Fuel Combustion. Shows effects of bad firing and inefficient fuel combustion. Set in a destroyer at sea. 29 mins. 16 mm. only, silent. C.F.L.

Combustion. Production of coal from wood, use in various forms and application. 32 mins. 16 mm. only, silent. I.C.

Burning your Fuel. Shows how simply heat is lost, and methods of prevention. 10 mins. 16 mm. only. N.I.F.E.S.

Firing Your Fuel. Mechanical firing for solid smokeless fuels. 8 mins. 16 mm. only. N.I.F.E.S.

Diesel Generator as a Composite Heat and Power Unit. Outlines the theory and basic methods of waste heat recovery and shows the gain of higher thermal efficiency. 35 mins. S-M. & B.P.

Atomization. Discusses the technical aspects of combustion of oil fuels. S-M & B.P.

Combustion and the Chain Grate Stoker. Shows chemical and physical principles of coal, combustion, and their application in chain grate stoker. 25 mins. B. & W.

Pulverized Fuel. Deals with principles of pulverized fuel use. 40 mins. B. & W.

Industrial Electric Heating. Colour film on the use of electricity for industrial heating processes. 30 mins. E.D.A.

You and Your Fuel. This film attempts to show the many variations in the quality of coal, due to natural causes and why all the dirt and water cannot be removed before the coal is delivered to the customer. 16 mm. only. N.I.F.E.S.

You and Your Diesel. The importance of maintenance for diesel-engined lorries and tractors. In colour. 35 mins. S-M. & B.P.

Combustion. An instructional film for service engineers and boilerhouse staff. 30 mins. J.H.

Steam and Steam Generation. Film deals with the properties of steam, early boiler design and the modern steam generator design. 16 mm. silent. 31 mins. I.C.

The Low Ram Stoker. Comparison of hand firing practice and a modern design of automatic stoker. In colour. 16 mm. 18 mins. Shortened version 6 mins. J.H.

Gas Flow. Research into the effects of various types of flue baffles and bridge heights. 16 mm. 7 mins. J.H.

Air Flow. Experiments on the hydraulic flow model applied to the Chain Grate stoker. 16 mm. 9 mins. J.H.

The Properties of Coal. Explains difference between various coal gradings. Explanation of swelling number. 16 mm. 18 mins. J.H.

Key to Issuing Organizations:

A.I.L.—Allied Ironfounders Ltd., Brook Street, London, W.1.

B. & W.—Babcock & Wilcox Ltd., Babcock House, 209 Euston Road, London, N.W.1.

C.F.L.—Central Film Library, Government Buildings, Bromyard Avenue, Acton, London, W.3.

E.D.A.—Electrical Development Association, 2 Savoy Hill, London, W.C.2.

G.C.—The Gas Council, 1 Grosvenor Place, London, S.W.1.

I.C.—International Combustion Ltd., 19 Woburn Place, London, W.C.1.

J.H.—James Hodgkinson (Salford) Ltd., Brettenham House, Lancaster Place, Strand, London, W.C.2.

N.C.B.—National Coal Board, Film Department, 26-28 Dorset Square, London, N.W.1.

N.F.B.C.—National Film Board of Canada, 1 Grosvenor Square, London, W.1.

N.I.F.E.S.—National Industrial Fuel Efficiency Service, 71/72 Grosvenor Street, London, W.1.

S-M. & B.P.—Shell-Mex and B.P. Ltd., Public Relations Films, Shell-Mex House, Strand, London, W.C.2.

Film Strips

Air Pollution. Black and white. Prepared in consultation with Association of Public Health Inspectors. General survey of problem, methods of measurement, etc. (prepared by Camera Talks). Available from Society, complete with lecture notes, price 2 guineas. (Quote Ref. No. CT.58). Also **The Public Health Inspector.** Colour. £2 12s. 6d. (Quote Ref. No. CT.24).

The Role of Industry. Colour. Deals with the general problem, illustrates plant and appliances for preventing smoke and grit. (Prepared by Camera Talks in conjunction with Association of Public Health Inspectors). Available from Society, complete with lecture notes, £2 12s. 6d.

Smoke Control Areas. Colour. Deals with setting up of smoke control areas. Suitable for general public, officers and members of local authorities. (Prepared by Camera Talks in conjunction with Association of Public Health Inspectors). Available from Society, complete with lecture notes, £2 12s. 6d.

Air Pollution. (A) Its nature, production and effects, and (B) its dispersion and accumulation. Two film strips in colour, each containing 32 frames. Script by R. S. Scorer, PH.D. Foreword by Sir Hugh Beaver. (Prepared by Diana Wyllie Ltd.). Available from Society, price £4 the pair. (Quote Ref. No. DW.F.22/23).

Chronic Bronchitis. Colour. Shows effects of Air Pollution in causation of Bronchitis. Lecture notes by Dr. J. L. Burn, with Appendix on Air Pollution.

(Diana Wylie Ltd., in co-operation with Pfizer Ltd.). Available from the Society, price £2.

The Clean Air Act and Oil Fuel. Semi-animated film strip in colour. 16 mm. sound. For use on film projector. Outlines position of oil fuel in relation to Clean Air Act. Available on loan from Public Relations Department, Shell-Mex and B.P. Ltd., Shell-Mex House, Strand, London, W.C.2.

DIRECTORY OF ORGANIZATIONS

with Air Pollution Interests

Great Britain

Alkali Inspectorate:

Chief Inspector, Ministry of Housing and Local Government, Whitehall, London, S.W.1. (Whitehall 4300, Ext. 422).

Deputy Chief Inspectors, Ministry of Housing and Local Government, Whitehall, London, S.W.1. (Whitehall 4300, Exts. 30 and 645).

Chief Inspector for Scotland, Scottish Development Department, York Buildings, Queen Street, Edinburgh, 2. (Waverley 2491).

Architects and Surveyors, Incorporated Association of, 29 Belgrave Square, London, S.W.1. (Belgravia 3755).

Architects, Royal Institute of British, 66 Portland Place, London, W.1. (Langham 5533).

Arts, Royal Society of, 6-8 John Adam Street, London, W.C.2. (Trafalgar 2366).

Bristol and West Clean Air Committee, Public Health Inspectors' Department, Bluecoat House, Sawclose, Bath, Somerset. (Bath 5411).

British Industrial Measuring and Control Apparatus Manufacturers' Association, 11 Argyll Street, London, W.1. (Regent 0568).

British Ironfounders' Association, 30 St. James's Square, London, S.W.1. (Whitehall 6866).

British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1. (Euston 4499).

British Standards Institution, British Standards House, 2 Park Street, London, W.1. (Mayfair 9000).

British Steel Castings Research Association, The, East Bank Road, Sheffield, 2. (Sheffield 28647).

Building Centre, The, 26 Store Street, London, W.C.1. (Museum 5400).

Building Research Station, Bucknalls Lane, Garston, Watford, Herts. (Garston, Herts. 4040).

Cast Iron Research Association, British, Bordesley Hall, Alvechurch, Birmingham. (Redditch 2715).

Chemical Engineers, Institution of, 16 Belgrave Square, London, S.W.1. (Belgravia 3647).

Chemistry, Royal Institute of, 30 Russell Square, London, W.C.1. (Langham 3482).

City and Guilds of London Institute, 76 Portland Place, London, W.1. (Langham 3050).

Civic Trust, 79 Buckingham Palace Road, London, S.W.1. (Tate Gallery 0891).

Civil Engineers, Institution of, Great George Street, London, S.W.1. (Whitehall 4577).

Clean Air Council, Ministry of Housing and Local Government, Whitehall, London, S.W.1. (Victoria 8540, Ext. 681).

Clean Air Council for Scotland, Scottish Development Department, York Buildings, Queen Street, Edinburgh, 2. (Waverley 2491).

Clean Air, National Society for:

Central Offices: Field House, Breams Buildings, London, E.C.4. (Chancery 5038).

East Midlands Division: "Sandygate", Bramcote Lane, Wollaton, Nottingham. (Nottingham 284873).

North-East Division: Health Department, Town Hall, Newcastle-upon-Tyne, 1. (Newcastle 28520).

North-West Division: Health Department, Ryecroft Hall, Audenshaw, Lancs. (Droylsden 1355).

Northern Ireland Division: Public Health Department, 414 Ormeau Road, Belfast, 7. (642905).

Scottish Division: City Chambers, Glasgow. (Glasgow Central 9600. Ext. 529).

South-East Division: Public Health Dept., Springfield House, Hayes End Road, Hayes, Middlesex. (Hayes 1981).

South Wales and Monmouthshire Division: Public Health Department, Municipal Offices, Greyfriars Road, Cardiff. (Cardiff 31033, Ext. 344).

West Midlands Division: Public Health Inspector's Office, Council House, Smethwick, 40. (Smethwick 1461).

Yorkshire Division: Public Health Department, 12 Market Buildings, Vicar Lane, Leeds, 1. (Leeds 30211. Ext. 29).

Coal Board, National, Hobart House, Grosvenor Place, London, S.W.1. (Belgravia 2020).

Coal Utilisation Council, 19 Rochester Row, London, S.W.1. (Victoria 2339).

Coal Utilisation Research Association, British, Randalls Road, Leatherhead, Surrey. (Leatherhead 4411).

Coke Distributors' Associations, National Federation of, Terminal House, 52 Grosvenor Gardens, London, S.W.1. (Sloane 6120).

Area Offices:

London and Counties C.D.A.: Terminal House, 52 Grosvenor Gardens, London, S.W.1. (Sloane 6129).

Midland Counties C.D.A.: Land Gear House, 2181 Coventry Road, Sheldon, Birmingham, 26. (Birmingham, Sheldon 5327).

Northern C.D.A.: 54/55 Bondgate, Darlington, Co. Durham. (Darlington 2832).

North Eastern C.D.A.: West Bar Chambers, 38 Boar Lane, Leeds, 1. (Leeds 33361).

Wales C.D.A.: 4 Dock Chambers, Bute Street, Cardiff. (Cardiff 29649).

Lancashire and District C.D.A.: Whitworth House, 115 Princess Street, Manchester, 1. (Manchester Central 3437).

Coke Oven Managers' Association, 1 Cliff Street, Mexborough, Yorks.

Coke Research Association, British, Chesterfield, Derbys. (Chesterfield 76821).

Coking Industry Association, British, 74 Grosvenor Street, London, W.1. (Mayfair 9736).

Combustion Engineering Association, 70 Jermyn Street, London, S.W.1. (Whitehall 5536).
Corrosion Engineers, British Association of, P.O. Box 25, Trafalgar Square, London, W.C.2.
Council for the Protection of Rural Wales, (Cymdeithas Diogelu Harddwch Cymru), y Plas, Machynlleth, Mont. (Machynlleth 2287).
County Boroughs' Association, Town Hall, Oxford. (Oxford 49811).
County Councils Association, Eaton House, 66A Eaton Square, London, S.W.1. (Belgravia 5173).
County Councils in Scotland, Association of, 3 Forres Street, Edinburgh. (Caledonian 1626/7).

Domestic Solid Fuel Appliances Approval Council, 1 Grosvenor Place, London, S.W.1. (Belgravia 4321).

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Electrical Engineers, Institution of, Savoy Place, London, W.C.2. (Covent Garden 1871).
Electrical Research Association: Offices, Library and Laboratories, Cleeve Road, Leatherhead, Surrey. (Leatherhead 4151).
Electricity Council, 30 Millbank, London, S.W.1. (Victoria 2333).
Electricity Generating Board, Central, Bankside House, Sumner Street, London, S.E.1. (Waterloo 2011).

Federation of British Industries, 21 Tothill Street, London, S.W.1. (Whitehall 6711).
Forest Products Research Laboratory, Princes Risborough, Aylesbury, Bucks. (Princes Risborough 101–2).
Fuel, Institute of, 18 Devonshire Street, London, W.1. (Langham 7124).

Gas Council, The, Murdoch House, 1 Grosvenor Place, London, S.W.1. (Belgravia 4321).
Gas Engineers, Institution of, 17 Grosvenor Crescent, London, S.W.1. (Belgravia 8266).
Gas Industries, Society of British, 16 Grosvenor Crescent, London, S.W.1. (Belgravia 5632).
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Housing Centre Trust, 13 Suffolk Street, London, S.W.1. (Whitehall 2881).
Housing, Institute of, 50 Tufton Street, London, S.W.1. (Abbey 5066/7).

Iron and Steel Federation, British, Steel House, Tothill Street, London, S.W.1. (Whitehall 1030).
Iron and Steel Research Association, British, 24 Buckingham Gate, London, S.W.1. (Tate Gallery 7931).

London and Home Counties Clean Air Advisory Council, 31 Charing Cross Road, London, W.C.2. (Trafalgar 7070, Ext. 4).
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Glasgow: City 3451.
Manchester: Deansgate 6701.
Southampton: Southampton 28844.
Meteorological Society, Royal, 49 Cromwell Road, London, S.W.7. (Kensington 0730).
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Scottish Development Department, York Buildings, Queen Street, Edinburgh, 2. (Waverley 2491).
Sheffield and District Clean Air Committee, Town Hall, Sheffield. (Sheffield 27241).
Shell-Mex and B.P. Ltd. Shell-Mex House, Strand, London, W.C.2. (Temple Bar 1234).
Social Service, National Council of, 26 Bedford Square, London, W.C.1. (Museum 8944).
Solid Smokeless Fuels Federation, 74 Grosvenor Street, London, W.1. (Mayfair 3327).
Standing Conference of Co-operating Bodies, Department of Scientific and Industrial Research, State House, High Holborn, London, W.C.2. (Chancery 1262).
Stationery Office, Her Majesty's, Atlantic House. Holborn Viaduct, London, E.C.1. (City 9876).
Structural Insulation Association, 32 Queen Anne Street, London, W.1. (Langham 7616).

Tees-side Clean Air Committee, Town Clerk's Office, Municipal Buildings, Middlesbrough. (Middlesbrough 45984).
Town and Country Planning Association, 28 King Street, Covent Garden, London, W.C.2. (Temple Bar 5006).
Town Planning Institute, 18 Ashley Place, London, S.W.1. (Tate Gallery 1466/7).

Urban District Councils' Association, Palace Chambers, Bridge Street, London, S.W.1. (Whitehall 4868).

Warren Spring Laboratory, (D.S.I.R.), Gunnels Wood Road, Stevenage, Herts. (Stevenage 2080).
Warwickshire Clean Air Council, Town Hall, Royal Leamington Spa. (Leamington Spa 27072).
West Bromwich Clean Air Council, 2 Lodge Road, West Bromwich.
West Lancashire and Cheshire Regional Smoke Abatement Committee, c/o Health Department, Hatton Garden, Liverpool, 3. (Liverpool Central 8433. Ext. 180).
West Riding Clean Air Advisory Council, Public Health Department, 25 East Parade, Leeds, 1. (Leeds 30661).
Women of Great Britain, National Council of, 36 Lower Sloane Street, London, S.W.1. (Sloane 0619).
Women's Advisory Council on Solid Fuel, The, 18 South Molton Street, London, W.1. (Mayfair 5358).
Women's Gas Federation, 5 Grosvenor Crescent, London, S.W.1. (Belgravia 4321).

Overseas

Austria
Austrian Society of Industrial Medicine, Kinderspitalgasse 15, Vienna, 9.

Belgium
Conseil National Contre la Pollution de l'Air, 6, Place de Martyrs, Brussels.
Society of Health and Social Medicine. Secretary: Professor Graffar, Professor of Social Medicine, Liberal University of Brussels.
Cebedair, 2, rue Armand Stévart, Liége.

Czechoslovakia
Institut of Hygiene, Bratislava, U.C. Csl. Armady 52
Research Institute of Air Moving Equipment, Prague 10, Malesice.
Research Institute for Inorganic Chemistry, Ústí nad Labem.

Denmark
Cinderkoks Information, Raadhuspladsen 59, Copenhagen 5.
Densk Kedelforening, Vesterbrogade I.A., Copenhagen.

France
Association pour la Prévention de la Pollution Atmosphérique. M. Yvan Queret, 62 rue de Courcelles, Paris 8.
Association Technique de l'Industrie du Gaz en France, 62, rue de Courcelles, Paris, 8.
Centre d'Information pour le Développement de Conditionnement d'Air, de la Ventilation, du Filtrage de l'Air et du Dépoussierage, 38 rue Copernic, Paris 16.
Charbonnages de France, 9 Avenue Percier, Paris 8.
Institut National d'Hygiène, 11 bis rue de Milan, Paris 9.
Institut Français des Combustibles et de l'Energie, 3 rue Henri Heine, Paris 16.
Institut National de Recherche Chimique Appliquée, 12 Quai Henri IV, Paris 4.
Societé Française des Pétroles BP, 21 rue de la Bienfaisance, Paris 8.
Union Européenne de Medicine Sociale, 1 rue de Courcelles, Paris 9.

Germany
Agrikulturchemisches Institut, Heiligenhaus Bez, Am Vogelsang 14, Düsseldorf.
Bundesministerium für Gesundheitswesen, Michaelstr 10, Bad Godesberg.
Deutsche Gesellschaft für Mineralölwissenschaft und Kohlechemie e.V. Mittelweg 180, Hamburg 13.

Deutscher Stadtetag, Lindenallee 11, Köln-Mariènburg.
Deutscher Verein von Gas-und Wasserfachmännern. Beethovenstr. 17, Frankfurt (Main).
Gaswärme-Institut Essen e.V. Holbeckshof, Essen-Steele 43.
Hygienisches Institut, Gorch-Fock-Wall 15/17, Hamburg 36.
Institut für Gewerbliche Wasserwirtschaft und Luftreinhaltung e.V. Habsburgerring 2/12, Köln 5.
Institut für Grubensicherheit und Arbeitsschutz, Kirchgasse 11, Freiberg/Sa.
Institut für Technische Physik der Frauenhofer-Gesellschaft, Königstr 70/74, Stuttgart-Degerloch. Dr.-Ing. Reiher, Director.
Institut für Wasser, Boden und Lufthygiene Corrensplatz 1, Berlin 33.
Landesanstalt für Bodennutzungsschutz des Landes Nordrhein-Westfalen, Marienplatz 4, Bochum.
Ruhrkohlen-Beratung GmbH, Frau-Bertha-Krupp-Str. 4, Essen.
Staubforschungsinstitut des Hauptverbandes der Gewerblichen Berufsgenossenschaften e.V.
Langwartweg 103, Bonn. Prof. Winkel, Director.
Steinkohlenbergbauverein, Friedrichstr 2, Essen 1. Prof. Weissner.
Technischer Überwachungs-Verein Essen e.V. Steubenstr. 53, Essen 1.
Verein Deutscher Eisenhüttenleute, Breite Strasse 27, Düsseldorf.
Verein Deutscher Ingenieure (Kommission Reinhaltung der Luft), Prinz Georg Strasse 77/79, Düsseldorf. Secretary: M. Kraemer.
Vereinigung der Grosskesselbesitzer e.V. Kurfürstenstr. 27, Essen 1.

Italy

ILVA Society, Via Corsica 4, Genoa.
Institute of Hygiene, University of Ferrara, Corso Giovecca 173A, Ferrara.
Institute of Hygiene, University of Genoa, Via A. Pastore 1, Genoa.
Instituto di Ingegneria Sanitaria del Politecnico di Milano, Piazza Leonardo da Vinci 32, Milan.
Stazione Sperimentale per i Combustibili, Via G. Pascali 55, Milan.
NANS (Union of Nations for Fight against Noise and Smog) via Garibaldi 25, Turin.

Japan

Institute of Public Health, Shirokanedaimachi Shiba, Minato-ku, Tokyo.

Netherlands

Central Organization/Applied Scientific Research T.N.O., Committee for Industrial Air Pollution, 12, Koningskade, The Hague.
Commission for Soil, Water, and Air, Baan 170 Rotterdam.
Research Institute for Public Health Engineering T.N.O., (Organization for Health Research T.N.O.) Industrial Air Pollution Division, c/o 12, Koningskade, The Hague.
Stichting Concawe (For conservation of clean air and water from oil refinery activities in Western Europe). 700 van Alkemaadelaan, The Hague. Secretary: Mr. G. P. Liedmeier.

Norway

Institute of Hygiene, University of Oslo, Blindern, Oslo.
Røykskaderådet, c/o Ministry of Industry, Oslo.

Poland

State Institute of Hygiene, 24 Chocimska Street, Warsaw.

South Africa

National Physical Laboratory of the Council for Scientific and Industrial Research. Box 395, Pretoria, Transvaal.

Spain

Municipal Institut of Hygiene, Place de Lesseps 1. Barcelona.

Sweden

AB Svenska Fläktfabriken, Kungsgatan 18 Stockholm.

U.S.A.

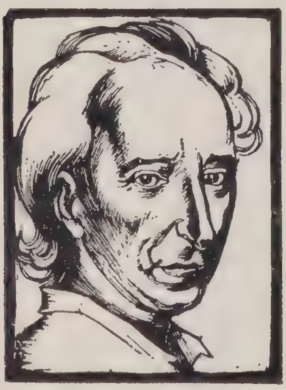
Air Pollution Control Association, 4400 Fifth Avenue Pittsburgh, 13 Pa.
Air Pollution Foundation, 2556 Mission Street, San Marino, California.
Bay Area Air Pollution Control District, 1480 Mission Street, San Francisco 3, California.
Bituminous Coal Research, Inc., 121 Meyran Avenue at Forbes, Pittsburgh 13, Pa.
California State Motor Vehicle Pollution Control Board, 217 W. First Street, Los Angeles 12, California.
Los Angeles County Air Pollution Control District, 434 S. San Pedro Street, Los Angeles 13, California.
New York Dept. of Air Pollution Control, 15 Park Row, New York 38 N.Y.
Robert A. Taft Sanitary Engineering Centre, 4676 Columbia Pky., Cincinatti 26, Ohio.
U.S. Dept. of Health, Education and Welfare, Public Health Service, Division of Air Pollution, DHEW Building South, Washington 25, D.C.

U.S.S.R.

Institute of Communal Hygiene, Pogodinskaja 10, Moscow.
Medical Control Committee on Air Pollution, State Medical Commission, Moscow.
State Committee on Chemistry, Moscow.

World Health Organization

Division of Environmental Sanitation, Palais des Nations, Geneva, Switzerland.
Regional Health Officer, Office for Europe, 8 Scherfigsvej, Copenhagen, Denmark.



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(*as at April* 23, 1964) (Associate Members in *Italics*)

Scottish Division

Aberdeen, Airdrie, Ardrossan, *Ayr C.C.*, *Ayr*, Barrhead, Clackmannan C.C., Clydebank, Coatbridge, Dumbarton, Dumfries, Dunbarton C.C., Dundee, Dunfermline, East Kilbride, Edinburgh, Falkirk, Fife C.C., Glasgow, Grangemouth, *Hamilton*, Hawick, Inverness C.C., Inverness, Irvine, Johnstone, Kilmarnock, Kilsyth, Kirkcaldy, Kirkintilloch, Lanark C.C., Motherwell & Wishaw, Paisley, *Perth C.C.*, Perth, *Port Glasgow*, *Renfrew C.C.*, Renfrew, Rothesay, Rutherglen, Stirling C.C., Stirling, West Lothian C.C.

Northern Ireland Division

Antrim C.C., Ballymena, Belfast, Carrickfergus, Castlereagh, Londonderry.

North West Division

Abram, Accrington, Altrincham, Ashton-in-Makerfield, Ashton-under-Lyne, Atherton, Audenshaw, Bacup, Barrow-in-Furness, Bebington, *Birkenhead*, Blackburn, Blackpool, Bolton, *Bootle*, Bredbury & Romiley, Brierfield, Burnley, Bury, Buxton, Chadderton, Cheadle & Gatley, Cheshire C.C., Chester, Chorley, Church, *Clitheroe*, Colne, Connah's Quay, Crewe, Crompton, *Crosby*, *Cumberland C.C.*, Darwen, Denton, Droylsden, Dukinfield, Eccles, Ellesmere Port, Failsworth, Farnworth, Fleetwood, Flint, Fulwood, Glossop, Golborne, Great Harwood, Hale, Haslingden, Haydock, Hazel Grove & Bramhall, Heywood, Hindley, Horwich, *Hoylake*, Huyton-with-Roby, Hyde, Ince-in-Makerfield, Irlam, Kearsley, Kirkby, Lancashire C.C., Lancaster, Lees, Leigh, Leyland, Littleborough, *Liverpool*, Longdendale, Macclesfield, Manchester, Marple, Matlock, Middleton, Middlewich, Mold, Morecambe & Heysham, Nantwich, Nelson, Newton-le-Willows, Northwich R.D.C., Northwich U.D.C., Oldham, Ormskirk, Padiham, Preston, Preston R.D.C., Prestwich, Radcliffe, Ramsbottom, Rawtenstall, Rhyl, *Rishton*, Rochdale, Royton, Runcorn R.D.C., Runcorn U.D.C., St. Helens, Sale, Salford, Skelmersdale, *Southport*, Stalybridge, Standish-with-Langtree, Stockport, Stretford, Swinton & Pendlebury, *Thornton Cleveleys*, *Tintwistle*, Tyldesley, Up Holland, Urmston, Wallasey, Walton-le-Dale, Warrington, *Warrington R.D.C.*, *West Lancashire*, Whiston, Whitefield, Whitehaven, Whitworth, Widnes, Wigan, Wilmslow, Winsford, Workington, Worsley, Wrexham, Wrexham R.D.C.

North East Division

Ashington, Barnard Castle, Bedlingtonshire, Billingham, Bishop Auckland, Claydon, Brandon & Byshottles, Castle Ward, Chester-le-Street R.D.C., Chester-le-Street U.D.C., Consett, Crook & Willington, Durham, Eston, Felling, Gateshead, Gosforth, Hartlepool, Hebburn, Hetton, Houghton-le-Spring, Jarrow, Lanchester, Longbenton, Middlesbrough, Newburn, Newcastle-on-Tyne, Northumberland C.C., Prudhoe, Redcar, Ryton, Saltburn & Marske-by-the-Sea, Seaham, Sedgefield, Shildon, Skelton & Brotton, South Shields, Spennymoor, Stanley, *Stockton-on-Tees*, Sunderland, Sunderland R.D.C., Thornaby-on-Tees, Tynemouth, Wallsend, Washington, West Hartlepool, Whickham, Whitley Bay.

Yorkshire Division

Adwick-le-Street, Aireborough, Batley, Bentley-with-Arksey, Bingley, Bradford, Bridlington, Brighouse, Castleford, Colne Valley, Conisbrough, Cudworth, Darton, Dearne, Denby Dale, Dewsbury, Doncaster, Doncaster R.D.C., Elland, Halifax, Harrogate, Heckmondwike, Hemsworth R.D.C., Hemsworth U.D.C., Hepton, Holmfirth, Horbury, Horsforth, Hoyland Nether, Huddersfield, Ilkley, *Keighley*, Kingston-upon-Hull, Knottingley, Leeds, Meltham, Mesborough, Mirfield, Morley, Normanton, North Riding C.C., Ossett, Otley, Pontefract, Pudsey, Queensbury & Shelf, Rawmarsh, Rotherham, Rothwell, Royston, *Scarborough*, Sheffield & District Clean Air Committee, Shipley, Skipton, Sowerby Bridge, Spenborough, Stanley, Swinton, Todmorden, Wakefield, Wakefield R.D.C., Wath-upon-Dearne, Wombwell, Worsbrough, Wortley, *York*.

West Midlands Division

Aldridge, Bedworth, Bilston, Birmingham, Brierley Hill, Brownhills, Burton-on-Trent, Cannock R.D.C., Cannock U.D.C., Coseley, Coventry, Darlaston, Dudley, Halesowen, Hereford, Kidderminster, Leamington Spa, Meriden, Newcastle-under-Lyme, Nuneaton, Oldbury, Redditch, Rowley Regis, Rugby, Rugeley, Sedgley, Smethwick, Solihull, Stafford, Staffordshire C.C., Stoke-on-Trent, Stone R.D.C., Stone U.D.C., Sutton Coldfield, Tipton, Walsall, Warwick, Warwick R.D.C., *Warwickshire C.C.*, Wednesbury, Wednesfield, *Wellington*, West Bromwich, Willenhall, Wolverhampton, Worcester.

East Midlands Division

Alfreton, Basford, Beeston & Stapleford, Belper, Bingham, Blaby, Blackwell, Bolsover, Boston, *Cambridge*, Carlton, Chesterfield, Chesterfield R.D.C., Clay Cross, Clowne, Coalville, Corby, Derby, Dronfield, Eastwood, Gainsborough, Glanford Brigg, Grantham, Great Yarmouth, Grimsby, Heanor, Hinckley, Ilkeston, Ipswich, Irthlingborough, Kettering, King's Lynn, Kirkby-in-Ashfield, Leicester, Lincoln, Long Eaton, Loughborough, Lowestoft, Mansfield, Mansfield Woodhouse, Newark, Norwich, Nottingham, *Nottinghamshire C.C.*, Old Fletton, Peterborough, *Repton*, Ripley, Rushden, Scunthorpe, Southwell, Staveley, Sutton-in-Ashfield, Swadlincote, Warsop, *Wellingborough.* West Bridgford, Wisbech, Worksop, Worksop R.D.C.

South West Division

Bath, Bristol, Cheltenham, Dursley, Gloucester, Kingswood, *Poole*, *Sodbury*, Stroud, *Tewkesbury*, Thornbury, *Weston-super-Mare*, West Penwith, Weymouth & Melcombe Regis.

South East Division

Acton, Amersham, Aylesbury, Barking, Barnes, Basildon, Battersea, *Beckenham*, Beddington & Wallington, Bedford, Bedfordshire C.C., Bermondsey, Bethnal Green, Bexley, Bishop's Stortford, *Bognor Regis*, *Bournemouth*, Braintree, Brentford & Chiswick, Brighton, Bromley, Bullingdon, Bushey, Camberwell, Carshalton, Chatham, Chelsea, Cheshunt, Chigwell U.D.C., Chislehurst & Sidcup, *Clacton*, *Coulsdon & Purley*, Crawley, Crayford, *Croydon*, Dagenham, Dartford, Dartford R.D.C., Deptford, Dover, Ealing, East Barnet, Eastbourne, Eastleigh, Edmonton, Egham, Elstree, Enfield, Epping & Ongar, Epsom & Ewell, Erith, Esher, *Essex C.C.*, Eton, *Farnborough*, Feltham, Finchley, Finsbury, Folkestone, Friern Barnet, Fulham, Gillingham, *Gosport*, Gravesend, *Greenwich*, Guildford, Guildford R.D.C., Hackney, Hammersmith, Hampstead, Harlow, Harrow, Hastings, Havant & Waterloo, Hayes & Harlington, Hemel Hempstead, Hendon, Heston & Isleworth, High Wycombe, Hitchin, Hoddesdon, Holborn, Hornchurch, Hornsey, Horsham, Hove, Ilford, *Kensington*, *Kent C.C.*, Kingston-upon-Thames, Lambeth, *Leatherhead*, Lewisham, Leyton, *Littlehampton*, London, City of, London C.C., *Luton*, Maidenhead, Malden & Coombe, Merton & Morden, *Mitcham*, New Forest, Northfleet, Orpington, Oxford, Penge, Poplar, *Portsmouth*, *Reading*, *Reigate*, Richmond, Rickmansworth, Rochester, Romford, St. Marylebone, *St. Pancras*, Shoreditch, Sittingbourne & Milton, Slough, Southall, *Southampton*, *Southend-on-Sea*, *Southgate*, Southwark, Southwick, Staines, Stepney, Stoke Newington, Strood, Sutton & Cheam, Thurrock, Tottenham, Twickenham, *Tunbridge Wells*, *Walthamstow*, Wandsworth, Wanstead & Woodford, Watford, Watford R.D.C., Wembley, *West Ham*, Westminster, Willesden, Wimbledon, Windsor, Windsor R.D.C., *Wood Green*, Woolwich, *Worthing*, Wycombe, Yiewsley & West Drayton.

South Wales & Monmouthshire Division

Abercarn, Aberdare, Abertillery, Barry, Bedwas & Machen, Bedwellty, Bridgend, Caerleon, Caerphilly, Cardiff, Cardiff R.D.C., Cwmbran, Ebbw Vale, Gellygaer, Glamorgan C.C., Llanelly, Llanelly R.D.C., Llantrisant & Llantwit Fardre, Magor & St. Mellons, Merthyr Tydfil, Monmouthshire C.C., Mountain Ash, Mynyddislwyn, Neath, Newport, Penarth, Pontypool, Pontypridd, Port Talbot, Rhondda, Risca, Swansea, Tredegar, Ystradgynlais.

Overseas

Durban (South Africa), Geleen (Netherlands), Johannesburg (South Africa), Leichhardt (Australia), *Newcastle* (Australia), *Vereeniging* (South Africa).

34th ANNUAL REPORT

for 1963

TO the Society as an organization, the year 1963 was satisfactory, but to the cause for which it exists there was a serious setback affecting the smoke control area programme. The situation that has arisen has been reported to members in the Society's journal and a recapitulation will also be included in the edition of the Clean Air Year Book in which this report will be published. Here it is only necessary to say that the new arrangements that have become necessary, though in some respects their need must be regretted, will be fully supported by the Society, which will also do its utmost to restore confidence in, and the momentum of, the domestic smoke control policy. In the long run, indeed, the technological changes that have made the changes necessary may be to the advantage of the clean air campaign and may promote the abatement of sulphur dioxide as well as of smoke. For the time being, however, it seems likely that there will be a slow-down in the rate of progress, but it is hoped that this will be only temporary. The Society has frequently declared that smoke control area programmes were proceeding more slowly than need be—or the Beaver Committee hoped for—and a much more strenuous effort in education, explanation and, perhaps, exhortation on our own part, and by all who are concerned, will be called for.

Except for this domestic control difficulty, much of positive value and interest has taken place during the year, as recorded in the pages of the Society's journal. In particular, the continuing success of the Clean Air Act in the industrial field is becoming more evident and this should not be overlooked.

The present situation in the domestic field, the growing pollution on the roads, the ever-increasing urbanization and industrialization taking place in many parts of the country, together with technological developments and the steady growth of population, as well as a greater public awareness of air pollution than in the past, all point to the need for the Society's work to expand in the future into new, important and sometimes difficult fields.

The Annual General Meeting

This was held in London on April 17, at the Royal Commonwealth Society, and was followed by a Luncheon, after which there was an open meeting arranged in conjunction with the South East Division.

Lord Cohen of Birkenhead's two years of office as President came to an end at the meeting and Dr. Albert Parker was elected to succeed him. Tribute must be paid to Lord Cohen for the great service he gave to the Society, both by his Presidency and by the two distinguished and authoritative Presidential Addresses he delivered at the annual conferences. Dr. Parker, well-known to many of our members as an eminent fuel technologist and as the former Director of the Fuel Research Station, was warmly welcomed as the new President. Mr. Stanley E. Cohen was unanimously re-elected Honorary Treasurer and, later, the new Executive Council re-elected Dr. J. L. Burn as its Chairman and Mr. James Goodfellow and Mr. T. Henry Turner as its Deputy Chairmen.

At the afternoon meeting following the A.G.M., four short papers were presented and discussed on the London smog episode of December 1962. Appreciation is recorded to the principal speakers: Dr. A. G. Forsdyke (Meteorological Office), Dr. S. R. Craxford (Warren Spring Laboratory), Dr. P. J. Lawther (Medical Research Council, Air Pollution Unit) and Mr. G. B.

Courtier (Public Health Department, London County Council). The meeting was reported in full in *Smokeless Air.*

The Society has recently benefited from legacies from two of its late members, one of which was for £550 and the other for about £5,000. To be remembered in this way is most gratifying and it is hoped that others may see their way to make the Society a beneficiary in their Wills.

Annual Conference

The Conference was held in Scarborough from October 8 to 11 and was attended by over 900 members and delegates. The Society's Clean Air Exhibition was again held in conjunction with the Conference and was a record for the number of exhibitors and the space they took. Addresses, papers and discussions —which are published in full in the *Proceedings* of the Conference—were informative and of a high standard, and among them must be mentioned the official opening address by the Parliamentary Secretary of the Ministry of Housing and Local Government, the Rt. Hon. Lord Hastings, an address of welcome by the Mayor of Scarborough, and Dr. Parker's first Presidential Address. Features of the Conference were a film show of clean air films, works visits, visits and tours for delegates' ladies, and the most friendly and enjoyable hospitality from the Mayor and Mayoress of Scarborough, Alderman and Mrs. W. H. Smith, J.P.

Obituary

It is with regret that we have to record the death during the year of two valued members of the Executive Council: Mr. F. J. Redstone, a former Chairman, and Mr. J. J. Matthews, Chairman of the Conference Committee until recently and Hon. Secretary since its inception of the South East Division. Two former members of the Council also died during the year, Dr. Andrew Shinnie and Mr. C. A. Stansbury. Appreciations were published in *Smokeless Air.*

Executive Council and Committees

The Executive Council, which now has 58 members, has met regularly as has its five permanent committees. These are General Purposes and Finance, Conference and Exhibition, Technical, Publicity, and Parliamentary and Local Government. Among the activities carried out was the preparation of a further statement on pollution from road vehicles, submitted on behalf of the Technical Committee to the Scarborough Conference, and an inquiry by the Parliamentary and Local Government Committee into aspects of industrial air pollution, a report on which will be made elsewhere. This Committee has also been preparing a memorandum on the air pollution aspects of refuse disposal, for submission to a Ministerial Working Party studying the subject.

Membership and Finance

Membership has continued to advance, although only to a limited extent, but subscription incomes have gratifyingly improved as a result of the increase in subscription rates approved at the Special General Meeting held in October, 1962. The changes affected Local Authority Members in particular but virtually all accepted them; our appreciation for their support and augmented contributions is warmly acknowledged. Expenditure has further increased, largely because of unavoidable higher administrative and printing costs etc., but as the accounts for the year will show, there was a substantial surplus on the year, thanks largely to the income derived from the annual conference and the exhibition.

Staff

There were no staff losses during the year and, with the number restored to its former level, conditions have improved, aided by loyal service and interest in the work of the Society, for which appreciation to all members of the staff is recorded. Better progress could, however, be made with projects and developments, and in the improvements and extension of services to members, if more trained staff was available. One further appointment may be made to help the Society to increase its efforts during the present uncertain phase.

Publicity and Services

Headquarters has been continuously active in supplying information, advice, publications, exhibits, posters and photographs to members, and indeed to many others. A close scrutiny is made of the Press cuttings that are received (8,500 during the year) and many letters to the Press have answered criticisms of clean air policy. Publicity to the Press of the Society and its activities has been secured and specially prepared "stories" have been widely issued for events such as the annual conference, the publication of *Smokeless Air*, the *Clean Air Year Book*, etc.

These publications have continued to be issued and, as far as resources allow, to be improved. There are many indications that they are valued for both the information they give and the interest that they stimulate.

The office has assisted, through its many contacts and sources of information, in assisting overseas visitors to arrange programmes of visits and meetings. It has also given advice and information to writers, editors and those preparing radio and television programmes. Such assistance is gladly provided because it promotes the Society's objects, but disappointment is sometimes felt at the lack of acknowledgment or reference to the Society for services that may have taken up a valuable amount of staff time.

New exhibits have been prepared, including kits of photographs and descriptive cards for sale, and a new leaflet for quantity sale entitled "Smoke Affects Your Health and Wealth" has been published. The Publicity Committee is engaged in preparing further material, which will be described as it becomes available in the journal and the *Year Book*.

It is a compliment to the Society that it should be the only non-Government organization to be represented (by its Director) on the team of rapporteurs from the United Kingdom to the various Working Parties preparing for the important Air Pollution Conference of the Council of Europe to be held in Strasbourg in June, 1964.

Officers, members of the Council and of the staff have participated in a number of broadcast and television features and have given addresses and lectures of various kinds. It is hoped that it will be possible to organize and develop arrangements for securing an increasing number of invitations to address meetings and to provide speakers, both nationally and locally, to address them. Mention should be made of the excellent work of the Divisions in their respective areas, which undoubtedly does a great deal to promote not only interest in clean air but support for the Society. Appreciation should, in particular, be expressed to the Divisional Hon. Secretaries, whose own reports will accompany this in the *Year Book*.

Field House,
Breams Buildings,
London, E.C.4.

J. L. BURN, *Chairman.*
STANLEY E. COHEN, *Hon. Treasurer.*
ARNOLD MARSH, *Director and Secretary.*

Divisional Reports

Scottish Division

Inverness was the meeting place for the Annual General Meeting and Conference of the Scottish Division on May 23 and 24, 1963.

At the Annual General Meeting Mr. John Innes demitted office as President of the Division and tribute was paid to the outstanding service he had rendered to the Division during his eight years in office. Councillor W. Monteith, Glasgow, was elected President in succession to Mr. Innes. Provost Alan Ross welcomed the delegates to Inverness and thereafter an address was given by the principal speaker, The Rt. Hon. Lord Craigton, C.B.E., Minister of State, entitled "Progress with Clean Air" (a synopsis of Lord Craigton's speech was printed in the Autumn 1963 edition of *Smokeless Air*). In the afternoon delegates paid a visit to Fasnakyle Power Station as guests of the North of Scotland Hydro-Electric Board. On the second day the speakers were H. L. Nicholson, Warren Springs Laboratory, Scottish Branch, on "The Measurement of Grit and Dust from Chimneys", Dr. L. E. Reed of Warren Springs Laboratory, Stevenage, on "A Guide to the Approval of Chimney Heights" and Dr. J. S. G. Burnett, Medical Officer of Health, Preston, on "The Problem of Diesel Smoke". Thereafter the luncheon for delegates and friends was held at the Caledonian Hotel and Arnold Marsh gave a report on the Society's activities during the past year. The Scottish Division was grateful to the Town Council of Inverness for making the Town Hall available for the Conference and for the very enjoyable reception and concert given by the Council to the delegates on the first evening.

The Division's classes for firemen in fuel control and boiler house practice continue to be well attended and nearly 100 firemen, etc. enrolled for the 1963/64 session.

The special committee appointed to consider methods of accelerating the formation of smoke control areas has met on several occasions throughout the year and the Council of the Division approved a memorandum prepared by the committee which was forwarded to the Scottish Development Department, containing suggestions and recommendations which would perhaps have the effect of encouraging local authorities to extend these areas. The Council have expressed considerable concern regarding the Circular issued by the Scottish Development Department which sets down the general pattern of the revised arrangements for smoke control areas following the issue of the White Paper on "Domestic Fuel Supplies and the Clean Air Policy". Prior to the issue of this circular a deputation from the Council was appointed to meet officials of the Department and the meeting will be held early in the New Year to make representations on some of the controversial points mentioned in the circular.

There does not appear to have been a shortage of smokeless fuels in Scotland this winter, but this may have been due to the mild weather. However, there is undoubtedly public complaint about the cost of all smokeless fuels and this will tend to deter local authorities from pressing ahead with their plans for smoke control areas.

J. W. TRAILL, *Hon. Secretary.*

Northern Ireland Division

The year was most satisfactory for the Divisional Organization and the Divisional Council met frequently.

Early in the year, at a meeting arranged by Shell-Mex and B.P. Limited, the Company's Northern Ireland Manager, Mr. J. R. Higdon, presented a copy of the Company's sound film "Clean Air" to the Rt. Hon. W. J. Morgan, J.P., M.P., Minister of Health and Local Government, who in turn presented it for safe keeping and use to Councillor Miss Irene M. E. McAlery, J.P., Chairman of the Divisional Council. This excellent film is being widely used and is meeting a real need.

At the Annual General Meeting, held on October 17, in the City Hall, Belfast, Councillor Miss Irene M. E. McAlery was re-elected Chairman, a constitution was adopted, and membership of the Divisional Council was increased from six to twelve members. We were privileged to have with us on this occasion the President, Dr. Albert Parker, C.B.E., who gave a most interesting address on the Air Pollution problem. The President was graciously received by the Minister of Health and Local Government and had a most valuable discussion with him on the Air Pollution problem. Before returning to London the President appeared on B.B.C. Television.

Towards the end of the year the Minister presented to Parliament the Clean Air Bill. The Bill has had a good reception, has received the second reading, and it is hoped will receive the Royal Assent in the not too distant future.

The Divisional Council has recently been strengthened by the co-option of Mr. J. Houston of Shell-Mex and B.P. Ltd.

The Division looks forward to a year of increased activity and usefulness.

W. E. C. O'BRIEN, *Hon. Secretary.*

North West Division

Despite the difficulties and frustrations caused by the delay in confirmation of Smoke Control Orders, we can again report a year of activity and progress in the North West Division.

The Annual General Meeting was held in the Gas Showrooms, Blackpool on February 7, 1963, and was preceded by a visit to the factory of Burton's Gold Medal Biscuits Ltd. Unfortunately, the inclement weather severely affected attendance.

The Joint Meeting with the Institute of Fuel took place on November 13, 1963, at the Engineers' Club, Albert Square, Manchester.

The Divisional Council met on four occasions and at the first meeting, Councillor H. W. Barnes was elected Chairman and A. Taylor, Deputy Chairman for the ensuing two years. This meeting was followed by an Address by A. N. Britten of I.C.I. Ltd. on the work that industry had been required to undertake to comply with the Clean Air Act, 1956. Your Council was so impressed by Mr. Britten's address that a recommendation was made to Headquarters that he be asked to give a paper at the Society's Annual Conference. The Conference Committee agreed and Mr. Britten introduced a Paper "Progress in the Heavy Chemical Industry". In the afternoon, members of the council had an opportunity to see what I.C.I. Ltd. had actually done in this field.

Two special Publicity Meetings were held during the year. The first, at Liverpool in October, was arranged as a joint meeting with the West Lancashire and Cheshire Regional Smoke Abatement Committee, and was addressed by Dr. P. J. Lawther, the Director, Air Pollution Research Unit of the Medical Research Council. At the second meeting in Blackburn in December, a panel of experts presided over by Arnold Marsh, the Director of the Society, answered questions on Smoke Control Areas, with particular reference to the Ministry of Housing and Local Government's letter dated October 11, 1963. Our thanks are due to the Blackburn Corporation and its Officers for the facilities provided.

In view of the new procedure for smoke control laid down in the letter of October 11, 1963, supplemented by Circular 69/63, at the last meeting of the Divisional Council a new Publicity Committee was formed. Their task is to organize a series of exhibitions devoted to the appliances to be used in Smoke Control Areas throughout the Division's area. This is one way that the new challenge we face in the battle for Clean Air will be met. A great deal of further endeavour will be necessary if the progress already made is to be continued and in thanking all Members of the Division for their continued support and enthusiasm during the year, we would ask for an even greater effort in 1964.

R. J. STANYARD, *Hon. Secretary.*

North East Division

In the North East region there arose a major crisis during the course of the year in the field of domestic smoke control when the Minister of Housing and Local Government decreed that the establishment of all future smoke control areas would be based upon the use of smokeless fuels other than gas coke. The pressing need for close and frequent consultation between members of the North East Division was amply demonstrated and once more served to demonstrate the absurdity of the restriction which this Council has endured for so long in relation to the holding of meetings. The urgent need for discussions on domestic smoke control policy resulted in many consultations on an unofficial basis between the public health inspection staff of the local authorities concerned and much of the good work achieved in this way should have been effected through the channels of the North East Divisional Council.

The Division's one and only meeting was held at Blyth Power Station in Northumberland on Wednesday, April 10, 1963, and at this meeting the Honorary Secretary described how he had made approaches to the Member of Parliament for Newcastle Central on the question of the restriction of meetings. These representations resulted in it being made clear by the Parliamentary Secretary to the Ministry of Housing and Local Government that there was no immediate hope of any relaxation on the embargo which appears to have been placed only on the North East Division so far as meetings were concerned and thus this anomalous absurdity continues and appears likely to continue indefinitely.

This meeting was attended by a total of 74 members who assembled at Newcastle-upon-Tyne and were transported to Blyth where, after refreshments, they were conducted over the Power Stations. Blyth Power Station will, when completed, be one of the largest and most modern power stations in Europe with an electrical output of 1,730 megawatts. Not only will it be capable of supplying the needs of the North East for some years, but it will export electricity beyond the region. A matter of local interest was that it will consume 5 million tons of low grade coal each year and give employment to 15 thousand miners.

After an adjournment for lunch the election of officers resulted in the unanimous re-election of Alderman B. N. Young of Gateshead as Chairman, Alderman A. J. Best of Darlington and Mr. P. C. G. Isaac of the University of Newcastle-upon-Tyne as Vice-Chairmen, Mr. F. Ireland, City Treasurer of Newcastle-upon-Tyne as Honorary Auditor and Mr. L. Mair of Newcastle-upon-Tyne as Honorary Secretary and Treasurer. The elections were followed by an address on "Electricity's Contribution to Clean Air" given by R. Lott, the Power Station Superintendent, who dealt with the generation of electricity, and by G. J. Hughes, Assistant Chief Commercial Engineer of the North Eastern Electricity Board, who dealt with the utilization aspect of electricity after distribution.

The meeting concluded with sincere thanks both to the Central Electricity Generating Board and the North Eastern Electricity Board for the generous hospitality and for the excellent arrangements which had enabled the meeting to be held in such interesting surroundings.

L. MAIR, *Hon. Secretary.*

Yorkshire Division

During the year the Divisional Council held meetings in Leeds (2); Wath-upon-Dearne; and at Chesterfield.

Two matters that have been subject to a great deal of discussion at our meetings during the year are (*a*) the extension of grants under the Clean Air Act, to include openable stoves and other appliances capable of burning hard coke; and (*b*) the coke supply situation for the near future.

On May 27, the Council held their meeting at the premises of the National Coal Board, at Manvers Main, Wath-upon-Dearne, where they were welcomed by Dr. Haslem at the Divisional Scientific Laboratories. The Council were conducted round the Laboratories and the Testing Room and saw various appliances under actual test with solid smokeless fuels.

Earlier in the year the Council were invited to visit the British Coke Research Centre at Chesterfield and on June 27 took advantage of this kind invitation. After a very brisk discussion on "Coke Supplies" they were shown the work carried on at the Centre, particularly that with regard to domestic coke and the considerable amount of work done on air pollution.

Press publicity during the year has been extremely good and has been of great help in developing properly informed public opinion in this Division.

JAMES GOODFELLOW, *Hon. Secretary.*

West Midlands Division

The Annual General Meeting of the Division was held at the Council House, Smethwick, on Wednesday, April 24, 1963. On the conclusion of official business, members were addressed by J. Beighton, B.SC., F.R.I.C., A.M.I.CHEM.E., M.INST.F., District Alkali Inspector. His subject was "Some Air Pollution Problems of the Ferrous and Non-Ferrous Industries". After lunch, members visited the works of Dartmouth Auto Castings Limited, Smethwick, to inspect hot blast cupolas and the measures taken to obviate nuisances arising therefrom. At tea, kindly provided by the firm, Mr. Brindley, Managing Director, dealt with the many questions raised.

The Autumn Sessional Meeting was held at the Berkeley Arms Hotel, Berkeley, Gloucestershire, on September 17. During the morning session, J. P. Montgomery, Assistant Chief Commercial Officer of the Midlands Electricity Board, spoke on developing trends in electricity usage, with particular reference to domestic block storage heaters. After lunch, kindly provided by the Midlands Electricity Board, members toured the Berkeley Nuclear Power Station, which was arranged with the co-operation of the South Western Region of the Central Electricity Generating Board. This meeting proved to be one of the most interesting and informative arranged by the Divisional Council.

A questionnaire sent to the Clerks of all local authorities on the question of caravans in smoke control areas yielded most valuable information, which was forwarded to headquarters for the attention of the Parliamentary and Local Government Committee of the Society.

During the year the Divisional Council were concerned with the adequacy of supplies of solid smokeless fuels.

W. L. KAY, *Hon. Secretary.*

East Midlands Division

The Society's activities in the Division continued satisfactorily. The Divisional Council met on three occasions and gave special consideration to the availability of solid smokeless fuel, the approved list of heating appliances, and the proposed amendments to clean air legislation contained in the Housing Bill.

Two general meetings were held and were well supported—

Belper—July 11, 1963. By invitation of Radiation Parkray Limited, members visited Park Foundry where domestic solid fuel heating appliances are manufactured. An address of welcome was given by W. A. Ballard, Director and General Manager, who surveyed the development of smokeless appliances and particularly the modern glass-fronted openable room heater. A brains trust comprising Messrs Ballard, Waugh, Peachey and Prothero answered members' questions on a wide range of subjects associated with smoke control. At the Annual General Meeting which followed H. N. Eardley was appointed Chairman of the Division for the year 1963-64 and Councillor Mrs. D. M. Ashley was appointed Deputy Chairman.

Alfreton—April 3, 1963. Members assembled to see a demonstration of the E.S.P. Smokeless Road Planer by invitation of E. Simms-Parkin, the inventor of the machine and Managing Director of Better Roads Limited. The meeting was of great interest, particularly to our local authority members who were aware of the very serious nuisance from dense black smoke often associated with the "burning off" of asphalt road surfaces. Mr. Simms-Parkin addressed the meeting on the design and working of the apparatus and answered numerous questions put to him by the delegates.

A. WADE, *Hon. Secretary.*

South East Division

The year was overshadowed by the death, in September, of the Honorary Secretary, Mr. J. J. Matthews. Mr. Matthews had served the Division in this capacity since its formation in 1953 and his enthusiasm, geniality and organizing ability will be sadly missed.

The Council met four times during the year and discussed, *inter alia*, future gas coke supplies, grants in respect of smokeless ignition in new houses in Smoke Control areas, portable incinerators, nuisances from bonfires, desirable amendments to Clean Air legislation etc.

On April 17, a joint meeting with the parent society was held under the Chairmanship of the President, Dr. Albert Parker. "An analytical survey of the 1962 Smog" was made by Dr. A. G. Forsdyke, Assistant Director, Meteorological Office, Dr. S. R. Craxford, Warren Spring Laboratory, Dr. P. J. Lawther, Director of the Air Pollution Research Unit, Medical Research Council and Mr. G. B. Courtier, Public Health Department, London County Council (Full report in *Smokeless Air*, Summer 1963).

Following the Divisional Annual General Meeting on July 3, two films were shown: "Clean Air" (a Shell Mex and B.P. public service film) and "The Berkeley Nuclear Power Station". Mr. L. A. Boxall of Shell-B.P. and Mr. H. G. Woodall of John Thompson Industrial Constructions Ltd., answered many questions. The Division has gratefully accepted from Shell-Mex and B.P. the gift of a copy of the film "Clean Air" for use by members.

The Division is indebted to the following bodies or firms who provided facilities for visits to their premises by members of the Society during the year:

The Gas Council, Watson House Centre, Fulham.
Associated Portland Cement Manufacturers, Cement Works, Swanscombe.
Shell-Mex & B.P. Ltd., Refinery and Laboratory, Isle of Grain.
Guinness Son & Co. Ltd., Brewery, Park Royal, Acton.
Tate & Lyle Ltd., Sugar Refinery, Silvertown, London.
British Railways, Maintenance Depot, Stratford, London.
London County Council, Laboratories, County Hall, London.
National Coal Board, Tilmanstone Colliery.

Excellent progress was maintained in establishing Smoke Control Areas in the Division, particularly in Greater London, with a resulting reduction in pollution in the area. Only three Local Authorities in the whole country have completed their Smoke Control programmes and all are in London—the City of London, the Metropolitan Borough of Holborn and the Metropolitan Borough of Stoke Newington.

JOHN S. HODGINS, *Hon. Secretary.*

Information About the Society

The forerunners of the Society were the Coal Smoke Abatement Society, established in London in 1899, the Smoke Abatement League of Great Britain (1909) concerned mainly with the Provinces, and the National Smoke Abatement Society, formed in 1929 by the amalgamation of the two parent organizations. At a Special General Meeting held in April 1957, it was agreed unanimously to change the name of the Society to "National Society for Clean Air", and to seek incorporation as a company limited by guarantee, a licence being sought from the Board of Trade to omit the word limited. The Society assumed its new name and status as from 1st January, 1958. For further information about membership, Executive Council and Committees, etc., reference should be made to the Society's Memorandum and Articles of Association and Byelaws.

Divisions

For electoral purposes and where it is desired, area organization, the Society is now composed of the following geographical Divisions: (1) Scotland, (2) Northern Ireland, (3) North West, (4) North East, (5) Yorkshire, (6) West Midlands, (7) East Midlands, (8) South West, (9) South East, (10) South Wales and Monmouthshire. (See Byelaws for the Counties in each Division).

Membership

The Society is wholly dependent on the contributions of its members for the growth and the maintenance of its work, and invites the support of all who sympathize with and wish to promote its objects. These are stated in full in the Memorandum of Association, but they may be briefly summarized as the securing throughout the United Kingdom of the maximum of natural light and air free from every form of pollution, particularly that arising from the combustion of fuel. There are three main classes of membership—for individuals, local authorities, and corporate bodies such as firms, public undertakings and institutions. Individual members and the representatives of other members have rights of nomination and voting in elections for Officers and Council. They receive, free of charge, the Society's quarterly journal *Smokeless Air* and other publications. Local authority and corporate full members are also entitled to receive one *extra* copy of *Smokeless Air* and the Society's Year Book for each guinea by which their subscription exceeds three guineas. Corporate members who have branches or offices in Divisions of the Society other than that in which their Registered Office is situated may appoint Delegates to participate in the activities of those Divisions. Members are entitled to receive assistance and information on problems relating to air pollution. In addition to receiving notices of meetings and conferences organized nationally, they are entitled to participate in any activities organized by or within their Division.

Associates

Any individual, local authority, institution or corporate body contributing less than the appropriate membership subscription may become an *Associate*, entitled to some of the privileges of membership, but not to those relating to nomination, voting and election to office.

Subscriptions

Individual Members—Not less than £1 1s. 0d. a year.

Local Authority Members—Not less than the following amounts, according to populations:

Less than 25,000	..	6 guineas
25,000 to 50,000	..	8 ,,
50,001 to 75,000	..	10 ,,
75,001 to 100,000	..	15 ,,
100,001 to 250,000	..	25 ,,
250,001 to 500,000	..	36 ,,
Over 500,000	..	48 ,,

Corporate Members (which includes Companies, Firms, and Departments of Local Authorities)—Not less than 25 guineas for members appointing two Representatives; not less than 15 guineas for members appointing one Representative.

(Under Article 5 (e) (ii) of the Society's Articles of Association, an Association or firm which is not incorporated can appoint representatives to act on its behalf, and obtain all the benefits of Corporate Membership.)

Sustaining Members—A Member in any class subscribing not less than £100 a year. (See list page 62).

Special Cases—The Executive Council may consider applications for membership on special terms as to subscriptions and otherwise. This rule is intended to apply in particular to local and other small voluntary associations wishing to become Corporate Members.

Associates—Any sum that is less than the appropriate subscription for membership.

Donations—The Society will be pleased to receive single or annual donations for any amounts from non-members.

Publications — Annual subscriptions may be made for *Smokeless Air* and for other publications as issued.

Payment of Subscriptions—The first subscription should be forwarded with application for membership. This may be sent at any time, and the subscription remains in force until the first day of the corresponding month of the following year. It is mutually advantageous if subscriptions are made by Banker's Order.

Covenant Donations—Annual contributions to the Society may be made under covenant, the Society being recognized as a "charity" by the Commissioners of Inland Revenue for this purpose. By signing an agreement to subscribe a stated sum for a period of at least seven years the Society may claim the amount of income tax that has been paid on such contributions, thereby increasing the benefit it receives without additional cost to the donor. Further particulars and form of covenant will be forwarded on request.

Representatives and Delegates

Local authority and Corporate Members are entitled to appoint Representatives to exercise on their behalf the rights of membership with regard to nomination for office, voting, receipt of publications, etc. Corporate Members may appoint one or two representatives each, according to subscription, and Local Authority Members a number according to population, as follows:

Less than 100,000	..	..	2
100,001 to 250,000	..	..	3
250,001 to 500,000	..	..	4
500,001 and over	..	..	5

Note: The Delegates mentioned previously participate in the activities of the Society *only* at Divisional level. A member's Representative exercises all the rights to which a member is entitled.

The names and addresses of Representatives should be forwarded on making application for membership, so that they may be entered in the Voting Registers.

Services to Members

Information and Advice

Advice, assistance and information on matters relating to atmospheric pollution and its prevention is available free of charge to Members, provided that, where necessary, the request is approved by the Executive Council. If the information required is not immediately available to the Society's Information Department, the Society is prepared, on behalf of a Member, to obtain it from one of the specialized Information Bureaux.

Library

The Society's Library is available for the use of all Members. It possesses classified files of Press cuttings, and an extensive collection of both British and foreign books, reports and pamphlets on air pollution and related subjects. In some cases, the Society is the only organization in the United Kingdom receiving the publication. Books and other publications are issued on loan, or may be consulted in the Society's offices. The Society is linked with various specialist and technical libraries, and when a publication relating to some special aspect of air pollution is not in the library, the Society can often borrow it through other sources. Applications should be made initially to the Librarian.

Lectures

The Society will be pleased to help members and others in any part of the country to arrange lectures and talks of all kinds on atmospheric pollution and related subjects.

Lantern Slides

A collection of lantern slides is available, and slides may be borrowed at a charge of 3d. per slide per lecture, plus the cost of registered postage.

Films

The Society does not possess films or film strips for loan, but a comprehensive list of films available from other sources is given elsewhere in this Year Book.

Exhibitions

The Society is ready to consider participating in exhibitions, and has a supply of display material and portable exhibition units for loan. The range of material is quite large, and to help members select exhibits suitable for their requirements, an illustrated catalogue has been prepared, which will be sent to those interested, on request.

Demand for this material is heavy particularly in spring and autumn, and it is advisable that inquiries should be made as early as possible in advance.

No charge is made for the loan of the material other than the cost of carriage. In order to keep these carriage charges to the minimum, some of the larger units have been distributed to the following Divisions: Scottish, North East, North West, Yorkshire, East Midlands, West Midlands, and in addition two units are kept at headquarters. Full details can be obtained from the Hon. Secretaries of the respective Divisions or from the Exhibitions Officer.

Publicity Advisory Service

The Society's Publicity Advisory Service is available to help Local Authorities and Corporate Members with their Clean Air Publicity, especially when Smoke Control Orders are pending.

The Service advises members on display material, its arrangement for exhibitions, stands, etc., gives guidance on the general organization of exhibitions and advises and supplies information on other publicity activities such as public meetings, local press features and correspondence, educational work in schools, women's organizations, etc.

No charge is made for this service to members.

The following display material is available on loan without charge to members, but the borrowers are required to pay the cost of transport both ways.

1. Framed posters under perspex. (Nos. P.1 to P.8 in Catalogue).
2. Damaged stonework.
3. Portable Exhibition Display Units, consisting of three double-sided panels, measuring 5′ 6″ x 3′ 8″, together with an attached table, for use in individual displays. (Ref. PS.1).
4. "Death in the London Fog, 1952." Information panel showing the death rate during the period of the 1952 Smog. (2′ x 1′ 5″). (Ref. IP.1).
5. "Why Have Soot With Your Custard?" Information panel showing pictorially the effect of Air Pollution on food. (2′ x 1′ 5″). (Ref. IP.2).
6. "Attack on Plant Life." Information panel showing the effect of air pollution

on the growth of plant life. (2′ x 1′ 5″). (Ref. IP.3).

7. "Holiday Resort." Information panel showing pictures of Colwyn Bay in winter and summer. (3′ 7″ x 2′ 6″). (Ref. IP.4).
8. "Domestic Smoke." Large illuminated photograph of domestic smoke. (4′ x 3′). (Ref. LP.1)
9. "Industrial Smoke." Large illuminated photograph of industrial chimneys emitting coal smoke. (4′ x 3′). (Ref. LP.2).
10. "Waiting for Smoke Control." Large photomural, showing panoramic view of a Northern town, with heavy smoke emission from domestic chimneys. (6′ x 3′ 6″). (Ref. LP.3)

An illustrated catalogue of these exhibits is available on request.

"Do-It-Yourself" Display Kits

The provision of these kits for sale to members is an innovation which it is hoped will prove to be of value to local authorities who are staging their own exhibitions. Each pack will consist of six display photographs, size 18″ x 15″ approximately, mounted on board, together with appropriate captions and headings, printed on card, and three coloured posters (double crown).

At present, two different kits are available and cost 80s. each:

DIY.1 Six Reasons for Smoke Control.

DIY.2 "Why Clean Air For Me?"—Answers to some of the arguments put forward by householders against smoke control.

Posters

The Society has a number of coloured and line posters available, ranging in price from 1s. 9d. per copy (double crown) to £7 10s. per 100 copies (with a reduction for Members). Crown line posters cost 8d. per copy to £2 8s. for 100 copies.

Two new posters have been produced during the year, the first is in connection with National Productivity Year and the second (in both double crown and crown sizes) is suitable for local overprinting.

The full list of posters available is as follows:

No. 1. "Smoke Spells Danger."
No. 2. "Clean Air is Your Affair."
No. 3. "It's Better Up Here . . ."
No. 4. "Prevent Air Pollution—Britain's Biggest Headache."
No. 5. "Smokeless Zones—Cleaner Homes."
No. 6. "Away with Smoke—Let in the Light."
No. 7. "They Didn't Know What to do!" (Crown size only)
No. 8. "We Have the Answer to Smoke." (Crown size only)
No. 9. "These are the Things that Smoke Does".
Nos. 10 and 11 "For Clean Air"—Poster designed for local overprinting (Double Crown and Crown sizes available).

Literature

Inquiries are invited on the supply of publications, give-away leaflets, etc., for special purposes. Particulars of these are given below and also in the Society's "Guide to Publications", on another page.

(1) "Descriptive Summary of the Clean Air Act." 6d. per single copy (by post 8d.), 4s. 6d. per dozen, or £1 10s. per 100.
(2) "Facts About Smoke." 16s. per 100, or £6 10s. per 1,000.
(3) "They Didn't Know What to do." 4s. per 100, or £1 10s. per 1,000.
(4) "Clean Air Begins at Home". 15s. per 100, or £6 per 1,000.
(5) "Smoke Affects Your Health & Your Wealth." 15s. per 100, or £6 per 1,000.
(6) Clean Air Cheques.—The cost of air pollution, stated simply and concisely on an imitation cheque form. £2 10s. per 1,000.
(7) Clean Air Bookmarks—4s. per 100, 30s. per 1,000.

Photographs

The Society has a classified and indexed collection of over a thousand smoke and other photographs, which are suitable for reproduction and/or exhibition purposes. Prints may be inspected at the Society's offices, or a selection will be sent by post if details of requirements are given. The copyright in the photographs is retained by the photographer, and where reproduction fees are chargeable, the inquirer should communicate with the photographer.

New photographs of high pictorial quality, with reproduction rights, are required, either as gifts or for payment at standard rates.

1962 £		£ s. d.	£ s. d.
	GENERAL FUND		
8,444	Balance as at January 1st, 1963 ..		11,187 1 10
2,743	*Add:* Surplus for the year		2,871 10 8
—	Legacy		552 19 0
11,187			14,611 11 6
	PREMISES RESERVE FUND		
667	Balance as at January 1st, 1963 ..	1,666 19 4	
1,000	*Add:* Transfer from Income and Expenditure Account	1,000 0 0	
1,667			2,666 19 4
12,854			17,278 10 10
	CURRENT LIABILITIES		
1,407	Sundry Creditors and Accrued Expenses		1,500 1 0
£14,261			£18,778 11 10

Stanley E. Cohen, *Honorary Treasurer*

Arnold Marsh, *Director and Secretary*

1962 £		£ s. d.	£ s. d.
	FIXED ASSETS		
	Office Equipment and Furniture *Note:* All Assets acquired under this heading have been written off against Revenue		Not Valued
	INVESTMENTS AT COST—QUOTED		
1,000	4½% Defence Bonds	1,000 0 0	
1,990	5½% Exchequer Stock 1966, £2,000 Stock	1,990 0 0	
279	British Transport £371.9.10. 3% Guaranteed Stock 1978-88 ..	279 5 11	
286	Commercial Union Assurance Co., 275 Stock Units of 5s. each ..	285 11 0	
1,015	Newcastle-upon-Tyne Corporation £1,000 6% Cons. Red. Stock 1973-76	1,015 6 0	
999	West Hampshire Water Co. 105 5½% £10 Preference Shares	999 9 0	
789	5% Conversion Stock 1971 £853.11.1.	789 1 8	
604	Steel Co. of Wales Ordinary Shares 250	604 0 1	
751	Charter Trust Agency Ltd. 750 Ordinary Units of 5s. each ..	750 16 11	
—	Imperial Chemical Industries Ltd. £1,000 6½% Convertible Unsecured Loan Stock 1972-77 ..	1,096 10 11	
7,713			8,810 1 6
	(Market Values at: 31.12.62 £7,684 31.12.63 £9,123)		
	INVESTMENTS AT COST—UNQUOTED		
	Social Service Supplies Ltd.:		
1	1 10s. Share	10 0	
100	Loan	100 0 0	
101			100 10 0
	CURRENT ASSETS		
487	Stock of Posters, Charts, etc. ..	567 0 0	
1,077	Sundry Debtors and Payments in Advance	1,143 16 11	
	Balance at Bank:		
4,388	Deposit Account	7,342 17 6	
456	Current Account	748 9 9	
39	Cash in Hand	65 16 2	
6,447			9,868 0 4
£14,261			£18,778 11 10

Income and Expenditure Account for the year ended 31st December, 1963

1962 £	EXPENDITURE	£	s.	d.	£	s.	d.
7,243	Salaries and Wages				9,281	4	6
2,286	Rent, Rates, Light and Heat				2,039	18	5
472	Office Supplies and Stationery				471	14	10
2,231	*Expenses including Postage, Telephone, Travelling, Insurance and Cleaning				1,642	10	9
	*General Expenses				109	19	6
440	Divisional Expenses				540	0	0
242	*Exhibitions and Material for Exhibitions				—		
—	*Information and Publicity Expenses				940	16	8
3,371	Printing *Smokeless Air* and Year Book	3,689	11	3			
2,846	*Less:* Receipts from Advertisements	2,958	7	6			
525					731	3	9
692	Printing and Publishing				838	5	11
1,096	Staff Pension Scheme				1,421	16	10
121	Office Equipment and Furniture				237	6	0
15,348					18,254	17	2
	EXCESS OF INCOME OVER EXPENDITURE						
1,000	Transfer to Premises Reserve Fund	1,000	0	0			
2,743	Balance to General Fund	2,871	10	8			
3,743					3,871	10	8
£19,091					£22,126	7	10

**Notes:* The Expenses have been analysed under new headings in 1963.

1962 £	INCOME	£	s.	d.	£	s.	d.
12,273	General Subscriptions and Donations				14,136	10	4
872	Sale of Publications				1,160	15	8
	Annual Conference Income	3,559	1	9			
	Less: Expenses	2,149	15	6			
11,393					1,409	6	3
6,002	Annual Exhibition Income	8,544	11	4			
	Less: Expenses	3,790	14	1			
5,391					4,753	17	3
10	Sundry Receipts				9	13	9
98	Interest of Bank Deposit Account	155	3	4			
315	Income from Investments (Net)	358	13	9			
132	Repayment of Income Tax	142	7	6			
545					656	4	7
£19,091					£22,126	7	10

REPORT OF THE HONORARY AUDITORS TO THE MEMBERS OF THE NATIONAL SOCIETY FOR CLEAN AIR

We have obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of the Audit. In our opinion proper Books of Account have been kept by the Society so far as appears from our examination of those Books. We have examined the Balance Sheet and annexed Income and Expenditure Account which are in agreement with the Books of Account. In our opinion and to the best of our information and according to the explanations given to us the said Accounts give the information required by the Companies Act, 1948, in the manner so required and the Balance Sheet gives a true and fair view of the state of the Society's affairs as at 31st December, 1963, and the Income and Expenditure Account gives a true and fair view of the surplus for the year ended on that date.

GEO. LITTLE, SEBIRE & CO., *Chartered Accountants.*
Adelaide House, London Bridge, London, E.C.4. *Hon. Auditors.*

25th February, 1964.

Subscriptions and Donations

January 1st to December 31st, 1963

* Denotes Covenant Donor

(2) denotes two Subscriptions received during the year

Scottish Division

	£	s.	d.
Aberdeen Corporation (2)	31	10	0
Airdrie Corporation	8	8	0
Ardrossan Corporation	6	6	0
Ayr County Council	5	5	0
Ayr Corporation	3	3	0
*Barclay-Smith, Lt. Col. E. A.	1	1	0
Barrhead Corporation	6	6	0
Broadbent, Mrs. H. W.	1	1	0
Broadbent, J.	1	1	0
Clackmannan County Council	8	8	0
Clydebank Corporation	10	10	0
Cooper, F. T.	1	1	0
Currie, T. S.	1	1	0
Dumbarton Corporation	6	6	0
Dumfries Corporation	8	8	0
Dunbarton County Council	26	5	0
Dundee Corporation	26	5	0
Dunfermline Corporation	8	8	0
East Kilbride Development Cpn.	7	7	0
East Kilbride Corporation	8	8	0
Edinburgh Corporation	37	16	0
Falkirk Corporation	8	8	0
Federated Foundries Ltd.	3	3	0
Fife County Council	26	5	0
Francis, S. H.	1	1	0
Gibb, Dr. W.	1	1	0
Glasgow Corporation	50	16	0
Grangemouth Corporation	6	6	0
Greenock Corporation	15	15	0
Hamilton Corporation	4	4	0
Hawick Corporation	6	6	0
Howden, James & Co., Ltd.	26	5	0
Hughes, H. S.	1	1	0
Hunter, R.	1	1	0
Inverness County Council	10	10	0
Johnstone Corporation	6	6	0
Kilmarnock Corporation	8	8	0
Kilsyth Corporation	6	6	0
Kirkcaldy Corporation	10	10	0
Kirkintilloch Corporation	6	6	0
Lanark County Council	37	16	0
Laurie, G.		5	0
McCrone, J.		10	0
Motherwell & Wishaw Corpn.	10	10	0
North of Scotland Hydro-Electric Board	15	15	0
Page, J.	1	1	0
Paisley Corporation	15	15	0
Park, W. Y. (2)	4	4	0
Perth County Council	3	3	0
Perth Corporation	8	8	0
Port Glasgow Corporation	2	2	0
Rackow, H.	1	1	0
Renfrew County Council	12	12	0
Renfrew Corporation	6	6	0
*Renwick, Dr. & Mrs. J.	1	0	0
*Ritchie, G. B.	1	1	0
Royal Sanitary Asscn. of Scotland	15	15	0
Rutherglen Corporation	6	6	0
Scottish Gas Board	73	10	0
Scott Park, Dr. & Mrs. S. D.	1	1	0
Shankland, Mrs. R.		15	0
Smith & Wellstood Ltd.	1	1	0
South of Scotland Elec. Board	50	0	0
Stirling County Council	26	5	0
Stirling Corporation	8	8	0
Tolhurst, A. E.	1	1	0
Tucker, Petrie	1	1	0
Waldie, J. & Sons Ltd.	1	1	0
West Lothian County Council	8	8	0
Wightman, Mrs. U. N.	1	1	0

Northern Ireland Division

	£	s.	d.
Antrim County Council	5	5	0
Ballymena Corporation	6	6	0
Belfast Corporation	37	16	0
Carey, Dr. G. C. R.	1	1	0
Castlereagh R.D.C. (2)	14	14	0
Davidson & Co. Ltd.,	15	15	0
Edwards, Dr. M. D.	1	1	0
Edwards, T. G.	1	1	0
*Ellison, C. A.	1	10	0
Guinness, Arthur Son & Co. (Belfast) Ltd.	12	12	0
Heywood, T. H.		15	0
Hood, N. R. J.	1	1	0
Jenkins, Major W.	1	1	0
Londonderry County Council	10	10	0
Lynas, K. H.	1	10	0
McAlery, Cllr. Miss I. M. E. (2)	2	2	0
Musgrave & Co. Ltd.	26	5	0
Northern Ireland Housing Trust	15	15	0
O'Brien, W. E. C.	1	1	0
Ormeau Bakery Ltd.	15	15	0
Pemberton, Professor J.	1	1	0
Porter, Colonel H. J.	2	2	0
Reynolds, A.	1	10	0

North West Division

	£	s.	d.
Abram U.D.C.	6	6	0
Accrington Corporation	8	8	0
Affleck & Brown Ltd.	2	2	0
Aitkenhead, Miss M.	1	0	0
Altrincham Corporation	8	8	0
Amende, H. F.	1	0	0
Andrews, K.		12	6
Anonymous	20	0	0
Ashton Bros. & Co. Ltd.	2	2	0
Ashton-in-Makerfield U.D.C.	6	6	0
Ashton-under-Lyne Corpn.	8	8	0
Atherton U.D.C.	6	6	0
Audenshaw U.D.C.	6	6	0
Bacup Corporation	6	6	0
Barnes, Cllr. W.	1	1	0
Barrow-in-Furness Corpn.	10	10	0
Baxendale & Co. Ltd.	2	2	0
Bayes, Alderman Mrs. M. (2)	6	6	0
*Beard, E.	2	17	0
Beattie, E. & F. Ltd.	1	1	0
Bebington Corporation	10	10	0
Behrens, A.		10	0
Bibby, H. P.	2	0	0
Bibby, J. & Sons Ltd.	15	15	0
Birkenhead Corporation	2	2	0
Blackburn Corporation	26	5	0
Blackpool Corporation	26	5	0
Bolton Corporation	26	5	0
Bootle Corporation	12	12	0
Bredbury & Romiley U.D.C.	6	6	0

	£	s.	d.
Brierfield U.D.C.	6	6	0
British Insulated Callender's Cables Ltd.	15	15	0
*Brown, P. S.	1	1	0
Burnley Corporation	15	15	0
Bury Corporation	10	10	0
Buxton Corporation	6	6	0
Campbell, Mrs. I. G.	1	1	0
Cass, H. V.	1	0	0
Chadderton U.D.C.	8	8	0
Cheadle & Gatley U.D.C.	8	8	0
Cheshire County Council	50	8	0
Chester R.D.C. (2)	14	14	0
Chorley Corporation	8	8	0
Christian, F. V.	1	1	0
Church U.D.C.	6	6	0
Clarke, Mrs. M.	1	1	0
Clegg, E.	1	0	0
Clitheroe Corporation	3	3	0
Clusky, H.	1	1	0
Colne Corporation	6	6	0
Community Council of Lancashire	2	2	0
Connah's Quay U.D.C.	6	6	0
Cooper, Miss I.	1	1	0
Cotton, Cllr. S. A.	1	1	0
Coulthard, Miss D.	1	0	0
Crewe Corporation	10	10	0
Crompton U.D.C.	6	6	0
Crosby Corporation	3	3	0
Cumberland County Council	5	0	0
Darwen Corporation	8	8	0
Denton U.D.C.	8	8	0
Droylsden U.D.C.	8	8	0
Duguid, S.	3	3	0
Duguid, Mrs. S.	1	1	0
Dukinfield Corporation	6	6	0
Eccles Corporation	8	8	0
Ellesmere Port Corporation	8	8	0
Failsworth U.D.C.	6	6	0
Fallows, W. B.	1	1	0
Farnworth Corporation	8	8	0
Farquharson, G. W.	1	1	0
Ferranti Ltd.	21	0	0
Filter-Heat Ltd.	15	15	0
Fleetwood Corporation	8	8	0
Franklin, E. J.	1	1	0
Franklin, N. J.		15	0
Fulwood U.D.C.	6	6	0
Furness District Federation of Owner-Occupiers' Asscns.	2	2	0
*Gavaghan, Mrs. L. A.	1	1	0
Glossop Corporation	6	6	0
Golborne U.D.C.	6	6	0
Graham, M.	1	1	0
Great Harwood U.D.C.	6	6	0
Gregory, J. C.	1	0	0
Griffel, Dr. W.		10	6
Hale U.D.C.	6	6	0
Hall, A.	1	10	0
Hall, E. N.	1	1	0
Hall & Pickles Ltd. (2)	28	7	0
Hallows, V. K.	1	1	0
Haslingden Corporation	6	6	0
Haworth, Miss M.	1	1	0
Haydock U.D.C.	6	6	0
*Hayhurst, H.	1	1	0
Hazel Grove & Bramhall U.D.C.	5	5	0
Hetherington, H. (2)	2	2	0
Heywood Corporation	8	8	0
Hindley U.D.C.	6	6	0
Hindpool Owner-Occupiers' Asscn.	2	2	0
Hockton, D.	2	0	0
Hodgson, B.	1	1	0
Horwich U.D.C.	6	6	0
Hoylake U.D.C.	5	5	0
Huyton-with-Roby-U.D.C.	10	10	0
Hyde Corporation	6	6	0
Ince-in-Makerfield U.D.C.	6	6	0
Irlam U.D.C.	5	5	0
*Jackson, P. L.	1	1	0
Jewsbury, S.	1	1	0
Kearsley U.D.C.	6	6	0
*Keddie, Dr. J. T. Chalmers	1	1	0
Kirk, W. R.	1	1	0
Kirkby U.D.C.	10	10	0
Kitchener, The Rt. Hon. The Earl	1	0	0
Lancashire County Council	52	10	0
Lancashire & District Coke Distributors' Asscn.	26	5	0
Lancaster Corporation	8	8	0
Lane, Mrs. W.	1	1	0
Langford, A. S.		10	6
Lees U.D.C. (2)	11	11	0
Lees, Miss M.	1	1	0
Leigh Corporation	8	8	0
Leyland U.D.C.	6	6	0
Littleborough U.D.C.	6	6	0
Liverpool Corporation	10	10	0
Longdendale U.D.C.	6	6	0
Macclesfield Corporation	8	8	0
*Macnair, A. S.	1	1	0
MacWilliam, Dr. H. H.		15	0
Mains, H. D.	1	1	0
Manchester Corporation	50	8	0
Manchester & District Regional Clean Air Council	15	15	0
Marple U.D.C.	5	5	0
Martindale, J. R. L.	1	1	0
Martindale, R. L.	1	1	0
*Mather, W. L.	1	15	0
Mather & Platt Ltd.	50	0	0
Matlock U.D.C.	6	6	0
Mercer & Sons Ltd.	1	1	0
Merseyside & North Wales Elec. Board	39	0	0
Middleton Corporation	10	10	0
Middlewich U.D.C.	6	6	0
Mitchell, L. A.	1	1	0
Mold U.D.C.	6	6	0
Moore, H.	1	1	0
Morecambe & Heysham Corpn.	8	8	0
Nantwich U.D.C.	6	6	0
National Federation of Owner-Occupiers' & Owner-Residents' Asscns.	3	3	0
Nelson Corporation	8	8	0
Newton-le-Willows U.D.C.	6	6	0
Northern Gas Board—			
Carlisle	1	11	6
Penrith		10	6
Workington	1	11	6
North Western Elec. Board	66	0	0
North Western Gas Board	105	0	0
Northwich R.D.C.	8	8	0
Northwich U.D.C.	6	6	0
Norwood, Mrs. D. B.	1	1	0
Oldham Corporation	26	5	0
Ormskirk U.D.C.	6	6	0
Pike, Miss I. M.	1	1	0
Polding, W. W.		10	6
Preston Corporation	21	0	0
Preston R.D.C.	8	8	0
Prestwich Corporation	8	8	0
Radcliffe Corporation	8	8	0
Rae, Cllr. K. F.	1	1	0
Ramsbottom U.D.C.	6	6	0
Rawtenstall Corporation	8	8	0
Refuge Assurance Company	12	12	0
Reynolds, E.	1	1	0
Rhyl U.D.C.	6	6	0
Richards, J. E.	1	1	0
Rishton U.D.C.	2	2	0
Roberts, G.	1	1	0
Roberts, Miss M.	1	1	0
Robinson, Alderman Dr. J. (4)	4	4	0
Rochdale Corporation	15	15	0
Royton U.D.C.	6	6	0
Runcorn R.D.C.	8	8	0
Runcorn U.D.C.	8	8	0
St. Helens Corporation	21	0	0
Sale Corporation	8	8	0
Salford Corporation	26	5	0
*Scott, Mrs. A. O.	1	0	0
Semple, Professor A. B.	1	1	0
Shaw, Mrs. M.	1	1	0

	£	s.	d.
Skelmersdale U.D.C.	6	6	0
South-East Lancs. & Nth. Cheshire Consultative Cttee. for the Investigation of Atmospheric Pollution	2	2	0
Southport Corporation	1	1	0
Stalybridge Corporation	6	6	0
Standish-with-Langtree U.D.C.	6	6	0
Stockport Corporation	21	0	0
Stretford Corporation	8	8	0
Summers, John & Sons Ltd.	26	5	0
Swinton & Pendlebury Corpn.	8	8	0
Taylor, Mrs. E.	1	0	0
Taylor, F.	1	0	0
Taylor, P. C.		15	0
Taylor, S.	1	1	0
Thomas, F. L.	1	0	0
Thornton Cleveleys U.D.C.	5	5	0
Thorpe, J. A.	1	1	0
Tillotsons Newspapers Ltd.	15	15	0
Tintwhistle R.D.C.	2	2	0
Topham, Mrs. D. A.	1	1	0
Tyldesley U.D.C.	7	7	0
Up Holland U.D.C.	6	6	0
Urmston U.D.C.	8	8	0
*Vanstone, H. B.	1	16	0
Viney, N. H.	1	1	0
Wallasey Corporation	26	5	0
Walton-le-Dale U.D.C.	6	6	0
Warrington Local Medical Cttee.	2	2	0
Warrington R.D.C.	2	2	0
West Lancashire R.D.C.	1	1	0
Whiston R.D.C.	8	8	0
Whitefield U.D.C.	6	6	0
Whitehaven Corporation	8	8	0
Whitworth U.D.C.	6	6	0
Widnes Corporation	10	10	0
Wigan Corporation	15	15	0
*Williams, W. B.	1	0	0
Williamson, J. G.		15	0
Wilmslow U.D.C.	6	6	0
Winsford U.D.C.	8	8	0
Workington Corporation	8	8	0
Worsley U.D.C.	8	8	0
Wrexham Corporation	9	9	0
Wrexham R.D.C.	10	10	0

North East Division

	£	s.	d.
*Angus, Colonel E. G.	3	3	0
Ashington U.D.C.	8	8	0
*Atkinson, E.		15	0
Atkinson, H.	1	1	0
Barnard Castle R.D.C.	6	6	0
Bedlingtonshire U.D.C.	8	8	0
Billingham U.D.C.	6	6	0
Bird, D.	1	1	0
Bishop Auckland U.D.C. (2)	14	14	0
Blaydon U.D.C.	8	8	0
Brandon & Byshottles U.D.C.	6	6	0
Bulcock, The Reverend K.	2	0	0
Carr, W.	1	1	0
Castle Ward R.D.C.	6	6	0
Chester-le-Street R.D.C.	8	8	0
Chester-le-Street U.D.C.	6	6	0
Consett U.D.C.	8	8	0
Crook & Willington U.D.C.	6	6	0
Darlington Corporation	7	7	0
Dorman, Long & Co. Ltd.	15	15	0
Durham R.D.C.	6	6	0
Eston U.D.C.	8	8	0
Felling U.D.C.	8	8	0
Fletcher, D. R.	1	1	0
Gateshead Corporation	26	5	0
Gosforth U.D.C.	6	6	0
Hartlepool Corporation	6	6	0
Head Wrightson & Co. Ltd.	15	15	0
Head Wrightson Iron & Steel Works Eng. Ltd.	26	5	0
Hebburn U.D.C.	6	6	0
Hetton U.D.C.	5	5	0
Imperial Chemical Industries Ltd. (Billingham Division)	15	15	0
*Isaac, P. C. G.	1	1	0
Jarrow Corporation	8	8	0
Lanchester R.D.C.	6	6	0
Middlesbrough Corporation	26	5	0
Newburn U.D.C.	8	8	0
Newcastle-upon-Tyne Corpn.	37	16	0
Newcastle Regional Hospital Board	15	15	0
North Eastern Elec. Board	36	0	0
Northern Coke Distributors' Assn.	15	15	0
Northern Gas Board—			
Blyth	1	1	0
Darlington	3	3	0
Hexham		10	6
Middlesbrough	4	4	0
Newcastle-upon-Tyne	21	0	0
Stockton-on-Tees	4	4	0
Sunderland	4	4	0
Northumberland County Council	37	16	0
Orchard, G. W.	1	1	0
Prudhoe U.D.C.	6	6	0
Redcar Corporation	8	8	0
Ryton U.D.C.	6	6	0
Saltburn & Marske-by-the-Sea U.D.C.	6	6	0
Seaham U.D.C.	6	6	0
Sedgefield R.D.C.	8	8	0
Shildon U.D.C.	6	6	0
Skelton & Brotton U.D.C.	6	6	0
Smith, R. D.	1	1	0
South Shields Corporation	26	5	0
Spennymoor U.D.C.	6	6	0
*Spriggs, Dr. E. A.	1	1	0
Stanley (Co. Durham) U.D.C.	8	8	0
Stockton-on-Tees Corpn.	5	5	0
Sunderland Corporation (2)	31	10	0
Sunderland R.D.C.	8	8	0
Tate, G. W.	1	1	0
Thornaby-on-Tees Corpn.	5	5	0
Tynemouth Corporation	10	10	0
University of Newcastle-on-Tyne	3	3	0
Wallsend Corporation	8	8	0
West Hartlepool Corporation	15	15	0
Whickham U.D.C.	6	6	0
Whitley Bay Corporation	8	8	0

Yorkshire Division

	£	s.	d.
Adwick-le-Street U.D.C. (2)	11	11	0
Aireborough U.D.C.	8	8	0
Allingham, J. C.	1	1	0
Atkinson, C. A. P.	1	1	0
Batley Corporation	6	6	0
Bentley-with-Arksey U.D.C.	6	6	0
Bingley U.D.C.	6	6	0
Boyd, Miss A. D.	1	1	0
Bradford Corporation	37	16	0
Bradford Civic Society	7	7	0
Bridlington Corporation	8	8	0
Brighouse Corporation	6	6	0
Brown, G. L.	2	2	0
Burn, Dr. A. Telford	1	1	0
Catterall, Dr. Mary	2	2	0
Clayton, Son & Co., Ltd.	2	2	0
Coke Oven Managers' Asscn.	5	5	0
Colne Valley U.D.C.	6	6	0
Conisbrough U.D.C.	6	6	0
Cudworth U.D.C.	6	6	0
Darton U.D.C.	6	6	0
Dearne U.D.C.	6	6	0
Denby Dale U.D.C.	6	6	0
Dewsbury Corporation	10	10	0
Doncaster Corporation	12	12	0
Doncaster R.D.C.	10	10	0
Elland U.D.C.	6	6	0
Etherington, H.	1	1	0
Gifford, Dr. P. W. W.	1	1	0
Gillions, K.	1	1	0
Goodfellow, J.	1	1	0
Hackney, E. S.	1	1	0
Halifax Corporation	15	15	0
Hargreaves Group Ltd.	15	15	0
Harrogate Corporation	10	10	0

	£	s.	d.
Heckmondwike U.D.C.	6	6	0
Hemsworth R.D.C.	10	10	0
Hemsworth U.D.C.	6	6	0
Hepton R.D.C.	6	6	0
Holdsworth, R. Y.	1	1	0
Holmes, W. C. & Co. Ltd.	26	5	0
Holmes, W. G.	2	10	0
Holmfirth U.D.C.	6	6	0
Horbury U.D.C.	6	6	0
Horsforth U.D.C.	6	6	0
Hoyland Nether U.D.C.	6	6	0
Huddersfield Corporation	26	5	0
Ilkley U.D.C. (2)	12	12	0
Jervis, Dr. J. Johnstone	1	1	0
Jones, L.	1	1	0
Jordan, H. H.	1	1	0
Keighley Corporation	2	2	0
Kingston-upon-Hull Corpn.	37	16	0
Knottingley U.D.C.	6	6	0
Leeds Corporation	50	8	0
*Marshall, G. C.	1	5	0
Meltham U.D.C.	6	6	0
Mexborough U.D.C.	6	6	0
Middlebrook, C. J.	1	1	0
Mirfield U.D.C.	6	6	0
Moore, L.		15	0
Morley Corporation	8	8	0
Normanton U.D.C.	6	6	0
North Eastern Coke Distributors' Asscn.	15	15	0
North Eastern Gas Board	50	8	0
North Riding of Yorkshire County Council	37	16	0
Nu-Swift International Ltd.	50	0	0
Ossett Corporation	6	6	0
Otley U.D.C.	6	6	0
Park Gate Iron & Steel Co. Ltd.	26	5	0
Pontefract Corporation	8	8	0
Potts, Miss E. M.	1	1	0
Pudsey Corporation	8	8	0
Queensbury & Shelf U.D.C.	6	6	0
Rawmarsh U.D.C.	6	6	0
Rotherham Corporation	15	15	0
Rothwell U.D.C.	8	8	0
Royston U.D.C.	5	5	0
Rushton, J. L.	1	1	0
Scarborough Corporation	2	2	0
Scargill, M.	1	1	0
Severs, J. S.	2	0	0
Sharp, A. I.	1	1	0
Sheffield & District Clean Air Committee	50	8	0
Shipley U.D.C.	8	8	0
Skinningrove Iron Co. Ltd.	10	0	0
Skipton U.D.C.	6	6	0
Sowerby Bridge U.D.C.	6	6	0
Spenborough Corporation	8	8	0
Stanley (Yorks.) U.D.C.	5	5	0
Steam Storage Co. Ltd.	1	1	0
Swinton U.D.C.	6	6	0
Todmorden Corporation	6	6	0
Topp, K. R.	1	1	0
Tuckley, Miss B. E.	1	1	0
*Underwood, Dr. G.	1	1	0
United Steel Companies Ltd.	50	0	0
Wakefield Corporation	10	10	0
Wakefield R.D.C.	6	6	0
Walker, Mrs. K. D.	1	1	0
Wath-upon-Dearne U.D.C.	6	6	0
West Riding Clean Air Advisory Council	5	5	0
Whitaker, F. P. G.	1	1	0
Wilson, H.	1	1	0
Wood, F. T.	1	1	0
Wood, P.	2	2	0
Wordley, W. A. (2)	1	16	0
Worsbrough U.D.C.	6	6	0
Wortley R.D.C.	6	6	0
York Corporation	5	5	0
Yorkshire Electricity Board	66	0	0

West Midlands Division

	£	s.	d.
Aldridge U.D.C.	10	10	0
Bedworth U.D.C.	6	6	0
Best, J. K.	1	1	0
Bilston Corporation	8	8	0
Birmingham Corporation	42	0	0
Brierley Hill U.D.C.	10	10	0
Brock, Dr. S. A.		15	0
Brooke, J. R.	1	1	0
Brownhills U.D.C.	6	6	0
Burton-upon-Trent Corpn.	6	6	0
Cadbury Bros. Ltd.	15	15	0
Cannock R.D.C.	8	8	0
Comley, A. & Wall Ltd.	1	1	0
Coseley U.D.C.	8	8	0
Coventry Corporation	31	10	0
Cradley Boiler Co. Ltd.	15	15	0
Danks, E. & Co. (Oldbury) Ltd.	26	5	0
Darlaston U.D.C.	6	6	0
Dickinson, S.	1	1	0
Dingley, Alderman W. L.	1	1	0
Dudley Corporation	10	10	0
Fletcher, J. P.	1	5	0
Frost, H. & Co. Ltd.	2	2	0
Garner, N. A.	1	0	0
Gibbons Bros. Ltd.	25	0	0
Gibbons, E. B.	10	0	0
Gimson, J. & Co. Ltd.	15	15	0
Guest, Keen & Nettlefolds Ltd.	50	0	0
G.W.B. Furnaces Ltd.	15	15	0
Halesowen Corporation	8	8	0
Hereford Corporation	8	8	0
Impett, C. E.	1	1	0
Kay, W. L.	1	1	0
Kidderminster Corporation	8	8	0
Lancashire Dynamo Electronic Products Ltd. (2)	47	5	0
Leamington Spa Corporation	6	6	0
Lichfield R.D.C.	8	8	0
Longley, J. C.	1	1	0
Machen, C.	1	1	0
Martine, Dr. W. R.	1	1	0
Meriden R.D.C.	10	10	0
Midland Counties Coke Distributors' Asscn.	15	15	0
Midlands Electricity Board	66	0	0
Midlands Joint Advisory Clean Air Council	10	10	0
Moore, J.	1	1	0
Newcastle-under-Lyme Corpn.	10	10	0
Nuneaton Corporation	8	8	0
Oldbury Corporation	10	10	0
Owen, A. G.	1	1	0
Pringle, Dr. J. E.	1	1	0
*Pringle, Dr. E.		15	0
Radiant-Heating Ltd.	5	5	0
Redditch U.D.C.	8	8	0
Rowley Regis Corporation	8	8	0
Rugby Corporation	8	8	0
Rugeley U.D.C.	6	6	0
Sedgley U.D.C.	6	6	0
Smart, R. C.		10	6
Smethwick Corporation	10	10	0
Solihull Corporation	15	15	0
Stafford Corporation	8	8	0
Staffordshire County Council	50	8	0
Steadman, A. T.	1	1	0
Stone R.D.C.	6	6	0
Stone U.D.C.	6	6	0
Strong, H.		15	0
Sutton Coldfield Corpn. (2)	18	18	0
Taylor, Mr. and Mrs. C. B.	2	2	0
Tipton Corporation	8	8	0
Wakelin, E. N.	1	1	0
Walsall Corporation	26	5	0
Waltho, R. B.	1	1	0
Warwick Corporation	6	6	0
Warwick R.D.C.	8	8	0
Warwickshire Clean Air Council (2)	47	5	0

	£	s.	d.
Warwickshire County Council	18	18	0
Wednesbury Corporation	8	8	0
Wednesfield U.D.C.	6	6	0
Wellington (Salop) U.D.C.	3	3	0
West Bromwich Corporation	15	15	0
West Midlands Gas Board	105	0	0
Willenhall U.D.C.	8	8	0
Wolverhampton Corporation	26	5	0
Worcester Corporation	10	10	0
Wright, J.	1	10	0

East Midlands Division

Alfreton U.D.C.	6	6	0
Ballard, W. A.	1	1	0
Basford R.D.C.	10	10	0
Beeston & Stapleford U.D.C.	10	10	0
Belper U.D.C.	6	6	0
Bingham R.D.C.	6	6	0
Blaby R.D.C. (2)	14	14	0
Blackwell R.D.C.	8	8	0
Bolsover U.D.C.	6	6	0
Boston Corporation	6	6	0
*Brown, J. A.	1	1	0
Cambridge Corporation	1	1	0
Carlton U.D.C.	8	8	0
Carpenter, The Reverend V. A.		10	6
Chesterfield Corporation	10	10	0
Chesterfield R.D.C.	15	15	0
Clarke, N.	1	1	0
Clay Cross U.D.C.	6	6	0
Clowne R.D.C. (2)	11	11	0
Coalite & Chemical Products Ltd.	300	0	0
Coalville U.D.C.	8	8	0
Corby U.D.C.	8	8	0
Davies, Dr. D.	1	1	0
Dearden, Mr. and Mrs. J.	3	0	0
Derby Corporation	26	5	0
Dronfield U.D.C.	6	6	0
Eales, C. D.	1	1	0
Eastern Electricity Board	66	0	0
East Midlands Elec. Board	51	0	0
East Midlands Gas Board	73	10	0
Eastwood U.D.C.	6	6	0
Fleming, I.	1	1	0
Ford, G. E.	1	1	0
Gainsborough U.D.C.	6	6	0
Grantham Corporation	8	8	0
Great Yarmouth Corporation	10	10	0
Grimsby Corporation	15	15	0
Gurney, J.	3	3	0
Heanor U.D.C.	6	6	0
Hiller, G. A.	1	1	0
Hinckley U.D.C.	8	8	0
Ilkeston Corporation	8	8	0
Ipswich Corporation	26	5	0
Irthlingborough U.D.C.	6	6	0
Kettering Corporation	8	8	0
King's Lynn Corporation	8	8	0
Kirkby-in-Ashfield U.D.C.	6	6	0
Leicester Corporation	37	16	0
Lewis, Mrs. A. B.	1	1	0
Lincoln Corporation	8	8	0
Long Eaton U.D.C.	8	8	0
Loughborough Corporation	8	8	0
Lowestoft Corporation	8	8	0
Low Temperature Coal Distillers Asscn.	15	15	0
Mansfield Corporation	10	10	0
Mansfield Woodhouse U.D.C.	6	6	0
McDonald, J. D.	1	1	0
Norwich Corporation	26	5	0
Nottingham Corporation	37	16	0
Nottinghamshire Cty. Council	10	10	0
Old Fletton U.D.C.	6	6	0
Orr, J. H.	1	1	0
Peterborough Corporation	10	10	0
*Pleister, Miss E. M. J.	1	1	0
Potter, Dr. N. M.	1	1	0
Repton R.D.C.	2	2	0
Ripley U.D.C.	6	6	0
Rushden U.D.C.	6	6	0
Scopes, F. V.	1	1	0
Scunthorpe Corporation	10	10	0
Southwell R.D.C.	8	8	0
Staveley U.D.C.	6	6	0
Stewarts & Lloyds Ltd.	50	0	0
Sutton-in-Ashfield U.D.C.	8	8	0
Swadlincote U.D.C.	6	6	0
*Turner, T. Henry	2	0	0
Vaites, J.		10	0
Wade, A.	1	1	0
Waring, F. L.	3	13	6
Warsop U.D.C.	6	6	0
Weldon, Miss G. M.	2	2	0
Wellingborough U.D.C.	3	3	0
West Bridgford U.D.C.	8	8	0
Wilkinson, J. R.	1	10	0
Wisbech Corporation	6	6	0
Woodcock, F. Huntly	1	1	0
Worksop Corporation	8	8	0
Worksop R.D.C.	6	6	0

South West Division

Bath Corporation	15	15	0
Blampied, F. C.	1	1	0
Bristol Corporation	37	16	0
Bristol & West Clean Air Cttee.	5	5	0
Cawley, Lady	3	0	0
Chudley, J. C.	2	2	0
Colehan, J. E.	1	1	0
Crook, S. C.	1	1	0
Dursley R.D.C.	6	6	0
Gloucester Corporation	10	10	0
Harris, J.	1	1	0
Howell, Dr. Handley B. (2)	2	2	0
Imperial Tobacco Company (of G.B. & Ireland) Ltd. (2)	47	5	0
Kingswood U.D.C.	8	8	0
Knowlson, J. M.	1	1	0
Matthews, Dr. N. E.	1	1	0
Poole Corporation	2	2	0
Porter, H. M.	1	1	0
Portishead U.D.C.	5	5	0
Redston, R. V.	1	1	0
*Rogers, P.	2	2	0
Sodbury R.D.C.	4	4	0
South Western Electricity Board	24	0	0
South Western Gas Board	36	15	0
Stroud U.D.C.	5	5	0
Tewkesbury Corporation	2	2	0
Thornbury R.D.C.	8	8	0
Walker, R.	1	1	0
Weston-super-Mare Corpn.	2	2	0
West Penwith R.D.C.	6	6	0
Weymouth & Melcombe Regis Corpn.	8	8	0
Whiting, G. C.	2	0	0
Wills, L. T.	2	2	0

South East Division

Acton Corporation	10	10	0
Acworth, A. W.	1	0	0
Acworth, Miss E. A.	1	1	0
Acworth, Miss W. B.	5	5	0
*Alston, Dr. J. M.	1	1	0
Ambuco Ltd.	15	15	0
Amersham R.D.C.	6	6	0
Armstrong, F. W.	1	0	0
Association of Public Health Inspectors	15	15	0
Atkinson, Mrs. M.	1	0	0
Ault, H.	1	1	0
Aylesbury Corporation	8	8	0
Bailey, H. D.	1	1	0
Baird, D. E.	1	1	0
Barash, Dr. M.	1	1	0
Barber, S. S.	1	1	0
Barking Corporation	10	10	0
Barnes Corporation	8	8	0
Basildon U.D.C.	8	8	0
Bastable, N.	1	1	0
Battersea Corporation	26	5	0

	£	s.	d.
Bearman, Mrs. E.	1	1	0
Beckenham Corporation	5	5	0
Beddington & Wallington Corpn.	6	6	0
Bedford Corporation	8	8	0
Bedfordshire County Council	37	16	0
Bermondsey Corporation	10	10	0
Bethnal Green Corporation	8	8	0
Bexley Corporation	15	15	0
Bishop's Stortford U.D.C.	6	6	0
Bligh, Mrs. M. F.	1	1	0
Bognor Regis U.D.C.	2	2	0
*Booth, G. M.	2	2	0
Bottom, D. W.	1	1	0
Boult, Sir Adrian C.	1	1	0
*Boult, Miss O.	3	3	0
Bournemouth Corporation	2	2	0
*Boyd, Miss D.	1	1	0
Braintree R.D.C.	6	6	0
Brighton Corporation	26	5	0
British Electrical Development Asscn.	250	0	0
British Iron & Steel Federation	350	0	0
British Medical Association	26	5	0
British Petroleum Co. Ltd.	100	0	0
British Railways Board	80	0	0
Bromley Corporation	10	10	0
Brooks, J. F.	1	1	0
*Brown, A. W.	1	1	0
Browne, Dr. D. Warren	1	1	0
Buckle, G. H. & Partners	26	5	0
Buist, Commander C.	10	10	0
Bullingdon R.D.C.	8	8	0
Burke, Dr. S. A.	1	11	6
Bushey U.D.C.	6	6	0
Butler, J. W.	1	11	6
Caller, Dr. S.		10	6
Camberwell Corporation	26	5	0
Capes, F. B. (2)	1	10	0
Carshalton U.D.C.	10	10	0
Cave, Miss R.	1	1	0
Central Electricity Generating Board	300	0	0
Chamuffin, R.C.	1	0	0
*Chantler, P.	4	4	0
Charrington, Gardner, Locket & Co. Ltd.	15	15	0
Chatfield, A. J.	1	1	0
Chatham Corporation (2)	14	14	0
Chelsea Corporation	8	8	0
Chennell, Captain C. A.		15	0
Cheshunt U.D.C.	8	8	0
Chislehurst & Sidcup U.D.C.	15	15	0
*Chivers, D. P.		15	0
Clacton U.D.C.	3	3	0
Clarke, Dr. R. T. V.	1	10	0
*Clarke, S. H.	1	0	0
*Clinch, H. G.	1	1	0
College of Fuel Technology	15	15	0
Corrall Ltd.	15	15	0
Coulsdon & Purley U.D.C.	1	1	0
Courtier, G. B.	1	5	0
Cousin, Lt. Col. A. J.	1	1	0
Crawley U.D.C.	8	8	0
Crayford U.D.C.	8	8	0
Dagenham Corporation	26	5	0
*Damon, W. A.	1	1	0
Danson, J.	1	1	0
Dartford Corporation	6	6	0
Dartford R.D.C.	8	8	0
Davies, P. M.	1	1	0
Davis, E. T. A.	1	1	0
Davis, Dr. J. B.	1	1	0
Deptford Corporation	10	10	0
Dobson, P. F.	1	0	0
Dover Corporation	8	8	0
Dray, F.	1	1	0
Drummond Patents Ltd.	15	15	0
Ealing Corporation	26	5	0
*East, R. G.	1	1	0
East Barnet U.D.C.	6	6	0
Eastern Gas Board	42	0	0
East Ham Corporation	21	0	0
Eastleigh Corporation	8	8	0
*Eaton, Dr. F. J.	3	10	0

	£	s.	d.
Ebben, G.	1	1	0
Edmonton Corporation	15	15	0
Egham U.D.C.	8	8	0
Electrical Asscn. for Women	26	5	0
Electricity Council	300	0	0
Elliott, Mrs. M. E.	1	1	0
Elliott Process Automation Ltd.	5	5	0
Elstree R.D.C.	6	6	0
*Elsworthy, J. G.	2	2	0
Enfield Corporation	26	5	0
Epping & Ongar R.D.C.	8	8	0
Epsom & Ewell Corporation	10	10	0
Erith Corporation	8	8	0
Esher U.D.C.	10	10	0
Essex County Council	3	3	0
Esso Petroleum Co. Ltd.	150	0	0
Eton R.D.C.	10	10	0
Farnborough U.D.C.	2	2	0
Feaver, R. J.	1	5	0
Federation of British Cremation Authorities	2	2	0
Feltham U.D.C. (2)	16	16	0
Finchley Corporation	10	10	0
Finsbury Corporation	8	8	0
Folkestone Corporation	8	8	0
Ford Motor Co. Ltd.	26	5	0
Fox, Dr. R. H.	1	1	0
Franklin, C. Ltd.	2	2	0
Friern Barnet U.D.C.	8	8	0
Fulham Corporation	26	5	0
*Gandy, Miss R. L.	2	2	0
Gardiner, P. C.	1	1	0
Garner, A. S.	1	1	0
Gas Council	250	0	0
Gibson, R. V.	1	1	0
Gillingham Corporation	10	10	0
*Gillison, Dr. J. A.	2	2	0
Gilpin, A.	1	1	0
Glover & Main Ltd.	10	0	0
Goodeve, Sir C. F.	2	2	0
Gosport Corporation	1	1	0
Graves, T. G.	1	1	0
Gravesend Corporation	8	8	0
Green, J.	1	1	0
Greenwich Corporation	3	3	0
Greenwood, Mrs. E. L.	1	1	0
Greenwood, T. A. S.		15	0
Guildford Corporation	10	10	0
Guildford R.D.C.	12	12	0
Guinness, A. Son & Co. (Park Royal) Ltd.	25	0	0
Gummer, R. H.	1	1	0
Hackney Corporation	26	5	0
Hales, J. S.	2	2	0
Halsted, V.	1	1	0
Hammersmith Corporation	26	5	0
Hampstead Corporation	15	15	0
Harlow U.D.C.	8	8	0
Harrold Leather Mfg. Co. Ltd	1	1	0
Harrow Corporation	26	5	0
Hayes & Harlington U.D.C.	10	10	0
Health Visitors' Asscn.	3	3	0
Held, P. E. J.	1	1	0
Hemel Hempstead Corporation	8	8	0
Hendon Corporation	26	5	0
Heston & Isleworth Corpn.	26	5	0
Hickman, Miss V.	1	1	0
High Wycombe Corporation	6	6	0
*Hillier, Miss E. L.	1	1	0
Hitchin U.D.C.	6	6	0
Hoddesdon U.D.C.	6	6	0
Holborn Corporation	7	7	0
Holiday Fellowship Ltd.	2	2	0
Holloway, H.	1	1	0
Holmwood, Miss J.	1	1	0
Honey, P.	1	11	6
Hornchurch U.D.C.	21	0	0
Hornsey Corporation	15	15	0
Horsham U.D.C.	6	6	0
Hove Corporation	10	10	0
Hulme, G. H.	1	5	0
Hussey, R.	1	1	0

	£	s.	d.
*Hutton, Dr. K. B.	10	0	0
Ilford Corporation	26	5	0
Imperial Chemical Indus. Ltd.	100	0	0
Institute of Fuel	26	5	0
Institution of Gas Engineers	15	15	0
International Nickel Company (Mond) Ltd.	15	15	0
James, B. W.		10	0
Johnston, H. V.	1	0	0
Joules, Dr. H. (2)	2	2	0
Kensington Corporation	3	3	0
Kent County Council	5	5	0
Kingston-upon-Thames Corpn.	8	8	0
Lambeth Corporation	26	5	0
Langwell, W. H.	1	0	0
Laundon, J. R.	1	1	0
Leagrave Press Ltd.	15	15	0
Leatherhead U.D.C.	2	2	0
*Lee, Sir Kenneth	1	0	0
*Lee, S. A.	1	5	0
*Lessing, Dr. R.	2	2	0
Leveson Gower, Miss V.	1	0	0
Lewisham Corporation	26	5	0
Leyton Corporation	15	15	0
Lister, B. S.	2	0	0
Littlehampton U.D.C.	1	11	6
London (City), Corporation of	50	8	0
London & Counties Coke Distributors' Asscn.	15	15	0
London County Council	50	8	0
London Electricity Board	60	0	0
London & Home Counties Clean Air Advisory Council	15	15	0
London Trades Council	2	2	0
London Transport Board	26	5	0
Luton Corporation	2	2	0
*Madelin, Sqn, Ldr. I.		15	0
Maidenhead Corporation	8	8	0
Malden & Coombe Corporation	8	8	0
Mann, A. C.	1	1	0
Manor Charitable Trustees	100	0	0
Mason, J. K.	1	1	0
Mather, L. E.	2	2	0
Medawar, Mrs. J. S.	1	0	0
Melland, B.	1	10	0
Merriman, Dr. A. D.	2	2	0
Merton & Morden U.D.C.	10	10	0
Metal Box Co. Ltd.	15	15	0
Miller, J. A.	1	1	0
Mitcham Corporation	2	2	0
Mobil Oil Co. Ltd.	26	5	0
Monkhouse, Dr. A. C.	1	1	0
Moor, Miss B. F. E.		15	0
Moore, G. A.	1	1	0
Moreland, S.	1	1	0
Municipal Passenger Transport Asscn. (Inc.)	15	15	0
National Carbonising Co. Ltd.	26	5	0
National Coal Board	1,000	0	0
National Federation of Coke Distributors' Associations	26	5	0
New Forest R.D.C.	10	10	0
Nonhebel, G.	1	1	0
Northfleet U.D.C.	6	6	0
North Thames Gas Board	105	0	0
Orpington U.D.C.	10	10	0
Oxford Corporation	21	0	0
Palmer, J. C.	1	1	0
Parker, Dr. A.	5	5	0
Parker, H.	1	1	0
Parry, M.		15	0
Pedrick, F.	1	1	0
Penge U.D.C.	8	8	0
Pennington, W. J.	1	1	0
Petrofina (Gt. Britain) Ltd.	26	5	0
Ponting, Cllr. J.	1	0	0
Poole, Mrs. W. M.	1	1	0
Poplar Corporation	8	8	0
Portsmouth Corporation	10	10	0
Powell Duffryn Heating Ltd.	15	15	0
Preston, Dr. T. W.	1	1	0
Public Transport Association	21	0	0

	£	s.	d.
Radiation Ltd.	31	10	0
Radiovisor Parent Ltd.	21	0	0
Readers' Digest Asscn. Ltd.	10	10	0
Reading Corporation	5	5	0
Reigate Corporation	1	1	0
*Richardson, R. L.	4	0	0
Richmond Corporation	8	8	0
Rickett Cockerell & Co. Ltd.	7	7	0
Rickmansworth U.D.C.	8	8	0
Rimmer, C. W. H.		10	0
Road Haulage Asscn. Ltd.	15	15	0
Robinson, Mrs. E.	2	2	0
Rochester Corporation	8	8	0
Rogers, Miss J. Scott	1	0	0
Romford Corporation	26	5	0
Roper, R.		10	6
Rosling, Miss E. M.	1	1	0
Royal Society of Health	15	15	0
St. Marylebone Corporation	10	10	0
St. Pancras Corporation	5	5	0
Satchwell Controls Ltd.	5	5	0
Scorer, Professor R. S.	1	1	0
Shanks, E. C.		15	0
Shell-Mex and B.P. Ltd.	150	0	0
Shoreditch Corporation	8	8	0
Slough Corporation	10	10	0
Smith, D. V. H.	2	2	0
Smith, Mrs. P.	1	1	0
Society of Medical Officers of Health	15	15	0
Solid Smokeless Fuels Fedn.	52	10	0
Southall Corporation	10	10	0
Southampton Corporation	1	1	0
South Eastern Elec. Board	39	0	0
South Eastern Gas Board	105	0	0
Southern Electricity Board	54	0	0
Southern Gas Board	36	15	0
Southgate Corporation	2	2	0
Southwark Corporation	15	15	0
Southwick U.D.C.	6	6	0
Staines U.D.C.	8	8	0
Stansfield, A. F.	1	1	0
Stepney Corporation	12	12	0
Stewart, R. E.	1	5	0
Stoddard, Dr. A.	2	0	0
Stoke Newington Corporation	6	6	0
Strood R.D.C.	5	5	0
Sturtevant Eng. Co. Ltd.	2	2	0
Sugg, Wm. & Co. Ltd.	2	2	0
Sullivan, J. S.	1	1	0
Sutherland, J. W.	1	1	0
Sutton & Cheam Corporation	15	15	0
Swift, S.	1	1	0
Taylor, C. P.		15	0
Taylor, M. L.	1	1	0
Thomas, R. W.	1	1	0
Thurrock U.D.C.	26	5	0
Tiranti, A.		6	0
Todd, G. F.	2	2	0
Tottenham Corporation (2)	47	5	0
Toussaint, Dr. C. H. C.	1	1	0
Trist, R. & Co. Ltd.	31	10	0
Twickenham Corporation	26	5	0
Tunbridge Wells Corpn.	1	1	0
Turner, Dr. W. C.	1	0	0
Des Voeux, Mrs. M. F.	5	5	0
Waddell, A.		15	0
Walthamstow Corpn.	3	3	0
Wandsworth Corporation	37	16	0
Wanstead & Woodford Corpn.	10	10	0
Ward, Dr. F. A. B.	1	10	0
Watford Corporation	10	10	0
Watford R.D.C.	10	10	0
Watson, Professor H. E.	2	0	0
Wembley Corporation	26	5	0
Wermann, J. C.	1	1	0
West Ham Corporation	1	1	0
Westminster City Council (2)	42	0	0
*White Drummond & Co. Ltd.	3	3	0
White, Dr. H. D. J.	1	0	0
Willesden Corporation	26	5	0
Willison, Mrs. M. E.	1	1	0
Wimbledon Corporation	10	10	0

	£	s.	d.
Windsor Corporation	8	8	0
Windsor R.D.C.	6	6	0
Winkworth, Mrs. D. M.		5	0
Winthrop, Miss S. E. D.	1	1	0
Women's Advisory Council on Solid Fuel	15	15	0
Women's Gas Federation (2)	47	5	0
Woodall-Duckham Construction Co. Ltd.	105	0	0
Wood Green Corporation	2	2	0
Woolwich Corporation	26	5	0
Worthing Corporation	2	2	0
Wright, F. E. S.	2	2	0
Wycombe R.D.C.	8	8	0
Yiewsley & West Drayton U.D.C.	6	6	0
Zealley, P. R.	1	1	0

South Wales and Monmouthshire Division

	£	s.	d.
Abercarn U.D.C.	6	6	0
Aberdare U.D.C.	8	8	0
Abertillery U.D.C.	8	8	0
*Bacon, N. P.	2	2	0
Barry Corporation	8	8	0
Bedwas & Machen U.D.C.	6	6	0
Bedwellty U.D.C.	8	8	0
Bridgend U.D.C.	6	6	0
Brown, Dr. J. A.	1	0	0
Caerleon U.D.C.	6	6	0
Caerphilly U.D.C.	8	8	0
Cardiff Corporation (2)	69	6	0
Cardiff R.D.C.	8	8	0
Clarke, J. A.	1	5	0
Coal Merchants Federation of Wales	5	5	0
Cwmbran U.D.C.	6	6	0
Ebbw Vale U.D.C.	10	10	0
Fitton, G.	1	1	0
Gellygaer U.D.C.	8	8	0
Harry, T. W.	1	1	0
Industrial Estates Management Corporation for Wales	15	15	0
Lacey, S. B.		15	0
Llanelly Corporation	8	8	0
Llanelly R.D.C.	8	8	0
Llantrisant & Llantwit Fardre R.D.C.	6	6	0
Magor & St. Mellons R.D.C.	6	6	0
Merthyr Tydfil Corporation	10	10	0
Monmouthshire County Council	37	16	0
Mountain Ash U.D.C.	8	8	0
Mynyddislwyn U.D.C.	6	6	0
Neath Corporation	8	8	0
Newport Corporation	26	5	0
Penarth U.D.C.	6	6	0
Pontypool U.D.C.	6	6	0
Pontypridd U.D.C.	8	8	0
Port Talbot Corporation	8	8	0
Rhondda Corporation	26	5	0
Risca U.D.C.	6	6	0
Silburn, Mrs. E.	1	1	0
South Wales Elec. Board	33	0	0
Steel Company of Wales Ltd.	50	0	0
Swansea Corporation	26	5	0
Swansea Port Health Authority	15	15	0
Thomas, Richard & Baldwins Ltd.	15	15	0
Tredegar U.D.C.	6	6	0
Wales Gas Board	26	5	0
Wales Coke Distributors' Assn.	15	15	0
Ystradgynlais R.D.C.	5	5	0

Overseas Subscriptions

	£	s.	d.
Benline, Commissioner A. J. (U.S.A.)	1	1	0
Buschmann, C. H. (Netherlands)	1	1	0
Dantin Gallego, Dr. J. (Spain) (2)	2	1	0
Durban Corpn. (Sth. Africa)	50	8	0
Elex, S. A. (Switzerland) (2)	5	18	0
English, Dr. B. V. (U.S.A.)	2	0	0
Feige, H. J. (Israel)	2	0	0
Ferguson, Dr. A. L. (Sth. Africa)	1	1	0
Geleen, Municipality of (Netherlands)	8	8	0
Guidee, C. (Belgium)	1	1	0
Hasselhuhn, B. (Sweden)	2	0	0
Jackson, C. L. (Ceylon)	1	1	0
Johannesburg Corpn. (Sth. Africa)	20	0	0
Johnson, K. R. (Sth. Africa)	2	2	0
Kettner, Dr. H. (Germany)	1	1	0
Leichhardt, Municipality of (Australia)	10	10	0
Mueller, Dr. P. K. (U.S.A.)	1	0	0
National Physical Research Laboratory (Sth. Africa)	5	5	0
Newcastle Corporation (Australia)	2	2	0
Ottolenghi, A. (Italy)	1	1	0
Pedrero, Dr. P. S. (Spain)	1	0	0
Reif, Dr. A. E. (U.S.A.)	1	1	0
Sordelli, Dr. D. (Italy)	1	1	0
Summers, P. W. (Canada)	2	0	0
Tetzlaff, F. (U.S.A.)	1	2	7
Vereeniging Corpn. (Sth. Africa)	1	1	0
Wight, Dr. J. Earle (Canada)	1	1	0
Subscriptions and donations under 5/–		2	6
	£14,136	10	4

Summary of Divisional Accounts

For the year ended December 31, 1963

Division	*Commencing balance* £	s.	d.	*Grants* £	s.	d.	*Other Income* £	s.	d.	*Expenditure* £	s.	d.	*Closing balance* £	s.	d.
Scotland	262	10	9	100	0	0	241	13	4(*a*)	432	2	2(*a*)	172	1	11
Northern Ireland	2	17	6	20	0	0		—		14	12	3	8	5	3
North West	35	14	10	120	0	0	1	1	0	175	14	11	18	19	1
														Debit.	
North East	43	5	7		—			19	3	4	3	10	40	1	0
Yorkshire	36	6	5	60	0	0		3	0	38	10	5	57	19	0
West Midlands	50	9	1	65	0	0	17	11	6	62	3	9	70	16	10
East Midlands	25	12	7	75	0	0		—		92	14	2	7	18	5
South East	1	11	5	100	0	0		—		85	15	3	15	16	2
South Wales & Mon.	90	19	10		—		15	15	0	35	5	6	71	9	4
Totals	549	8	0	540	0	0	277	3	1	941	2	3	425	8	10

Note:—(*a*) Includes fees and expenses for Annual Conference and Firemen's Classes.

F. E. BEAUMONT LTD.

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Aluminium Insulating Cladding solves corrosion and smut emission problems

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British Standard Specification 449/1948 & 1959.
Incorporating British Standard Code of Practise C.P.3. Chapter V and subsequent amendments.

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‘Off-peak’ electric storage heating is officially recommended for future Smoke Control Areas

(*See Ministry of Housing and Local Government Circular No. 69/63*)

Electric storage heaters meet all the requirements of the Clean Air Act.

Cheap to install. For existing premises, Unit-plan storage heaters are ideal—all that is needed for installation is a simple wiring job. For buildings still at drawing-board stage, electric floor warming is the cheapest system of all—it is incorporated as an integral part of the structure.

Cheap to run. Electricity is available at ‘off-peak’ rates. The cost per unit may be as little as *one-half* the normal rate.

Clean and convenient. ‘Off-peak’ electricity provides today’s cleanest and most convenient form of heating. It complies *in every respect* with the requirements of the Clean Air Act.

Electric storage heating supports the Government’s intention of encouraging vigorous action against pollution of the air in our cities and towns. It can make important contributions to this policy.

Free leaflet entitled “When your neighbourhood becomes a Smoke Control Area . . . here’s how Electricity can help you”—written to advise and inform the public. Fill in and post this coupon now for one copy—bulk supplies obtainable through your Electricity Board.

To: Electrical Development
Association (P/CY)
2 Savoy Hill, London W.C.2.

Please send me a free copy of “*When your neighbourhood becomes a Smoke Control Area . . . here’s how Electricity can help you*”.

NAME ....

ADDRESS ....

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TRADE DIRECTORY AND BUYERS' GUIDE

AIR CONDITIONERS (DOMESTIC)

Goblin (B.V.C.) Ltd., Goblin Works, Leatherhead, Surrey (Ashtead 6121). (*Portable domestic air conditioner.*)

AIR CONDITIONING EQUIPMENT

Air Control Installations Ltd., Victoria Road, Ruislip, Middlesex (VIKing 1222).
Wolverley House, Digbeth 5 (Midland 5148).
70 Mosley Street, Manchester 2 (Central 0679).
Cross House, Westgate Road, Newcastle 1 (28861).
701 Sauchiehall Street, Glasgow, C.3 (City 7281).

Air Distribution Equipment Ltd., Bentinck Road, West Drayton, Middlesex (West Drayton 2687). ("*Titus.*")

Bass, John, Ltd., B.M.B. Crawley Works, Fleming Way, Crawley, Sussex (Crawley 28765) (9 lines).

Carrier Engineering Co. Ltd., Carrier House, Warwick Row, London, S.W.1 (VICtoria 6858).

Davidson & Co. Ltd., Sirocco Engineering Works, Belfast, 5, Northern Ireland (Belfast 57251). ("*Sirocco.*")

Harrington, C. H. & Co. Ltd., 38/40 Howard Street, and 15/17 Howard Lane, Sheffield (Sheffield 28537).

Howorth, James & Co. Ltd., Victoria Works, Farnworth, near Bolton, Lancashire (Farnworth 1060-1).

Lightfoot Refrigeration Co. Ltd., The, Abbeydale Road, Wembley, Middlesex (PERivale 3322).

Lucas Industrial Equipment Ltd., Hargher Clough Works, Burnley, Lancashire (Burnley 5051). ("*Climasol*" *heat pumps*).

Luwa (U.K.) Ltd., Reliance House, 340 Clapham Road, London, S.W.9 (MACauley 0333).

Marshall & Parsons Ltd., 1111 London Road, Leigh-on-Sea, Essex (Southend 74867). ("*Draught-Master*" *Automatic one-way air inlet,* "*Flue-Master*" *automatic one-way air intake.*)

Matthews & Yates Ltd., Cyclone Works, Swinton, Manchester (Swinton 2273).

Modern Air Systems (Leicester) Ltd., 127 Barkby Road, Leicester (Leicester 67591/2).

Premier Oil Burners, Hednesford Road, Heath Hayes, Cannock, Staffs (Heath Hayes 296-297). (*Oil firing equipment manufacturers*).

Spencer & Halstead Ltd., Bridge Works, Ossett, Yorkshire (Ossett 821). ("*Spenstead.*")

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233). (*Central and unit plants.*)

Tempair Ltd., Romney Works, Romney Place, Maidstone, Kent (Maidstone 55188). (*Packaged air conditioners and cellar coolers.*)

AIR DIFFUSERS

Air Distribution Equipment Ltd., Bentinck Road, West Drayton, Middlesex (West Drayton 2687). ("*Titus.*")

Fairitt Engineering Co. Ltd., 101 Sandford Road, Moseley, Birmingham, 13 (SOUth 3651). Sales office: 24 Worple Road, Wimbledon, London, S.W.19 (LAKeside 1540). ("*Airmaster.*")

Harrington, C. H., & Co. Ltd., 38/40 Howard Street and 15/17 Howard Lane, Sheffield (Sheffield 28537).

AIR POLLUTION MEASUREMENT

Automatic Light Controlling Co. Ltd., 100 Holdenhurst Road, Bournemouth, Hampshire (Bournemouth 21445).

Austen Pumps, Charles, Ltd., Petersham Works, High Road, Byfleet, Surrey (Byfleet 43224/5). ("*Dymax*.")

Casella, C. F., & Co. Ltd., Regent House, Britannia Walk, London, N.1 (CLErkenwell 8581/7). (*Scientific and Meteorological Instruments.*)

Elliott Process Automation Ltd., Abbey Road, Park Royal, London, N.W.10 (ELGar 2111/7641).

Fleming Instruments Ltd., Caxton Way, Stevenage, Hertfordshire (Stevenage 804).

Glass Developments Ltd., Sudbourne Road, Brixton, London, S.W.2 (BRIxton 4041/3370). (*Measurement equipment.*)

Leeds & Northrup Ltd., Wharfdale Road, Tyseley, Birmingham, 11 (Acocks Green 6171/80). (*SO_2 Recorder, Thomas Autometer.*)

Visco Ltd., Stafford Road, Croydon, Surrey. (MUNicipal 3861) (10 lines).

AIR STERILIZATION

Howorth, James, & Co. Ltd., Victoria Works, Farnworth, near Bolton, Lancashire. (Farnworth 1060-1).

AUTOMATIC CONTROL EQUIPMENT

Danfoss (London) Ltd., 6 Wadsworth Road, Perivale, Middlesex (Alperton 2041).

Lancashire Dynamo Electronic Products Ltd. (M.I. Group), Rugeley, Staffordshire (Rugeley 371). (*Industrial electronic control equipment.*)

BACTERIA ELIMINATION

Howorth, James & Co. Ltd., Victoria Works, Farnworth, near Bolton, Lancashire (Farnworth 1060-1).

BOILERS, DOMESTIC

Clyde Fuel Systems Ltd., Queen Elizabeth Avenue, Hillington, Glasgow, S.W.2 (Halfway 3291) (8 lines).

C.T.C. Heat (London) Ltd., 17 Sloane Street, London, S.W.1 (BELgravia 3478 and 6286).

Delmore Engineering Co. Ltd., 51 Gresham Road, Staines, Middlesex (Staines 55293/4). (*Delmore domestic oil fired boilers.*)

Potterton, Thomas, Ltd., 20/30 Buckhold Road, London, S.W.18 (VANdyke 7202). ("*Potterton*" *gas and oil fired;* "*Diplomat*" *gas-fired.*)

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).
London showrooms: 229 Regent Street, London, W.1 (HYDe Park 7010).

Steam & Power Development Co. Ltd., 190 Wolverhampton Street, Dudley, Worcestershire (Dudley 53548). ("*Stempo*" *packaged solid smokeless fuel boilers—hot water and steam.*)

Wilson, Henry, & Co. Ltd., P.O. Box No. 6, Kirkby Industrial Estate, near Liverpool, Lancashire (Simonswood 3541) (9 lines). (*Wilson* "*Oilheat*" *oil-fired boilers and burners.*)

BOILERS, INDUSTRIAL

Babcock & Wilcox Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321).
Winchester House, Victoria Square, Birmingham, 2 (Midland 6741).
145 St. Vincent Street, Glasgow, C.2 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 4908).
Norfolk House, Grey Street, Newcastle-upon-Tyne (29212).
Aylward House, Wine Street, Bristol, 1 (294561).

Binner, T. G. (Boilers) Ltd., New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

Clyde Fuel Systems Ltd., Queen Elizabeth Avenue, Hillington, Glasgow, S.W.2 (Halfway 3291) (8 lines).

C.T.C. Heat (London) Ltd., 17 Sloane Street, London, S.W.1 (BELgravia 3478 and 6286).

G.W.B. Furnaces Ltd., P.O. Box No. 4, Dibdale Works, Dudley, Worcestershire (Dudley 55455).

Hoval Boilers (U.K.) Ltd., Kirkman House, 54a Tottenham Court Road, London, W.1 (LANgham 7749). (*Dual fired combination boilers and controls.*)

Marshall, Sons & Co. Ltd., Britannia Works, Gainsborough, Lincolnshire (Gainsborough 2301). (*Marshall automatic boilers.*)

Potterton, Thomas, Ltd., 20/30 Buckhold Road, London, S.W.18 (VANdyke 7202). ("*Potterton*" *and* "*Diplomat*".)

Steam & Power Development Co. Ltd., 190 Wolverhampton Street, Dudley, Worcestershire (Dudley 53548). ("*Stempo*" *package, hot water, steam, solid smokeless fuel.*)

Stone J. & Co. (Deptford) Ltd., Arklow Road, London, S.E.14 (TIDeway 1202). (*Stone-Vapor Boilers.*)

Suxé Combustion Ltd., Cupid Green Foundry, Hemel Hempstead, Hertfordshire (Boxmoor 3630). (*Möring boilers.*)

Wilson, Henry & Co. Ltd., P.O. Box No. 6, Kirkby Industrial Estate, near Liverpool, Lancashire (Simonswood 3541) (9 lines). (*Wilson* "*Oilheat*" *oil-fired boilers and burners.*)

BOILERS, INDUSTRIAL (SOLID FUELS)

Steam & Power Development Co. Ltd., 190 Wolverhampton Street, Dudley. Worcestershire (Dudley 53548). ("*Stempo*" *package, hot water, steam, solid fuel. Smokeless firing of bituminous coal.*)

BOILERS, PACKAGED (OIL-FIRED)

Stone, J. & Co. (Deptford) Ltd., Arklow Road, London, S.E.14 (TIDeway 1202). ("*Stone-Vapor.*")

BRICKWORK, BOILER SETTING

Chimney Construction Co. Ltd., Hagley Road, Stourbridge, Worcestershire (Stourbridge 5623).

BURNERS, GAS

Babcock & Wilcox Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321). ("*Babcock.*")

G.W.B. Furnaces Ltd., P.O. Box No. 4, Dibdale Works, Dudley, Worcestershire (Dudley 55455.)

Radiant-Heating Ltd., 475 Foleshill Road, Coventry (Coventry 88655). (*Industrial.*)

BURNERS, OIL

Babcock & Wilcox Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321). ("*Babcock.*")

Clyde Fuel Systems Ltd., Queen Elizabeth Avenue, Hillington, Glasgow, S.W.2 (Halfway 3291) (8 lines).

C.T.C. Heat (London) Ltd., 17 Sloane Street, London, S.W.1 (BELgravia 3478 and 6286).

G.W.B. Furnaces Ltd., P.O. Box No. 4, Dibdale Works, Dudley, Worcestershire (Dudley 55455).

Hope's Heating & Engineering Ltd., Halford Works, Smethwick, Birmingham 40 (Smethwick 2191).
16 Berners Street, London, W.1 (MUSeum 8412).
8 Cumberland Road, Leeds 6 (Leeds 5-6541 & 5-6555).
Splott Works, Walker Road, Cardiff (Cardiff 23581-2).
7 Pier Street, Hull (Hull Central 35346).

Premier Oil Burners, Hednesford Road, Heath Hayes, Cannock, Staffs (Heath Hayes 296-297). (*Oil firing equipment manufacturers.*)

Riley (I.C.) Products Ltd., 19 Woburn Place, London, W.C.1 (TERminus 2622). (*Oil burners, mechanical stokers, incinerators.*)

Swinney Brothers Ltd., Morpeth, Northumberland (Morpeth 3291).
2 The Broadway, London, W.6 (RIVerside 9611) ("*Enterprise*" *Rotary Oil Burners*).

Wilson, Henry & Co. Ltd., P.O. Box No. 6, Kirkby Industrial Estate, near Liverpool, Lancashire (Simonswood 3541) (9 lines). (*Wilson* "*Oilheat*" *oil-fired boilers and burners.*)

BURNERS, SOLID FUEL

Babcock & Wilcox Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321). ("*Babcock.*")

Earleymil Ltd., 212 Shaftesbury Avenue, London, W.C.2 (TEMple Bar 1680 and 3909). ("*Earleymil*" *automatic combustion equipment.*)

Lathe, Charles & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffs (Tipton 1887). ("*Claco*" *solid fuel burning appliances.*)

Riley (I.C.) Products Ltd., 19 Woburn Place, London, W.C.1 (TERminus 2622). (*Oil burners, mechanical stokers, incinerators.*)

Suxé Combustion Ltd., Cupid Green Foundry, Hemel Hempstead, Hertfordshire (Boxmoor 3630). (*Suxé*).

CEILINGS, HEATED

James, Richard (Westminster) Ltd., Ferry Works, Lacy Road, London, S.W.15 (PUTney 7792). (*Embedded hot water systems and Plasrib hot water heated acoustic ceilings.*)

CENTRAL HEATING SYSTEMS

Andrews-Weatherfoil Ltd., Powell Duffryn House, 19 Berkeley Street, London, W.1 (HYDe Park 7010).
Turncroft Lane, Stockport, Cheshire (Stockport 3441).
Lambeg Mills, Lisburn, Co. Antrim, Northern Ireland (Dunmurry 2542/3).

Baxi, Richard Baxendale & Sons, Bamber Bridge, Preston, Lancashire (Preston 85271). ("*Baxi*" *open-fire and gas warm air systems.*)

British Coking Industry Association, 74 Grosvenor Street, London, W.1 (MAYfair 9736). (*Sunbrite.*)

Carrier-Ross Engineering Co. Ltd., 22a Cavendish Square, London, W.1 (MAYfair 2364/6).

Heys, Leonard Ltd., Faraday House, Henry Street, Blackpool, Lancs. (46363, Telex 67636).

Jackson, J. B., & Partners Ltd., Hardwick's Way, Wandsworth, London, S.W.18 (VANdyke 9081).

James, Richard (Westminster) Ltd., Ferry Works, Lacy Road, Putney, London, S.W.15 (PUTney 7792).

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).
London showrooms: 229 Regent Street, London, W.1 (HYDe Park 7010).

Radiation Central Heating Ltd., Radiation House, North Circular Road, London, N.W.10. (WILlesden 1234) (*Small-bore and warmed air.*)

Radiation Parkray Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

CENTRAL OIL DISTRIBUTION SYSTEMS

BM Controls, 36 Kingston Road, Staines, Middlesex (Staines 51166). ("*BM*" *oil control valves, Oil lifters, etc.*)

CHIMNEYS

Binner, T. G. (Boilers) Ltd., New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

Beaumont, F. E., Ltd., Rathgar Road, Brixton, London, S.W.9 (BRIxton 4066, Telex: 25837). ("*Beauvent*" *steel chimneys.*)

Chimney Construction Co. Ltd., Hagley Road, Stourbridge, Worcestershire (Stourbridge 5623). (*Brick chimneys and boiler setting brickwork.*)

Combustion Equipment Ltd., 61 Belsize Lane, London, N.W.3 (SWIss Cottage 4462/3). (*Cory grit arresters, aluminium cladding for chimneys, Dribore chimneys. Mark IV furnace baffle for shell boilers, waste material disposal furnaces.*)

Jukes, Frederick Ltd., Royston Works, Garth Road, Lower Morden, Surrey (DERwent 2282). (*Steel Chimneys.*)

Neil, W. & Co. Ltd., 14a Hog Hill Road, Collier Row, Romford, Essex (Romford 61958).

Rodway & Taylor (Birmingham) Ltd., 85-90 Buckingham Street, Birmingham 19 (Central 4027-8). (*Dust, fume, ventilating and heating engineers.*)

Tipton Tub & Tube Co. Ltd., Bloomfield Road, Tipton, Staffordshire (Tipton 1011 & 3418).

Wright & Summerhill Ltd., Lupton Street, Leeds 10 (Leeds 75434/5). (*Sheet metal, ventilating and light constructional engineers.*)

CHIMNEY CLADDING (ALUMINIUM)

Beaumont, F. E. Ltd., Rathgar Road, Brixton, London, S.W.9 (BRIxton 4066, Telex: 25837). ("*Beauval*" *aluminium insulating cladding.*)

Combustion Equipment Ltd., 61 Belsize Lane, London, N.W.3 (SWIss Cottage 4462/3). (*Cory grit arresters. Dribore chimneys. Mark IV furnace baffle for shell boilers, waste material disposal furnaces.*)

Harrington, C. H. & Co. Ltd., 38/40 Howard Street and 15/17 Howard Lane, Sheffield, 1 (Sheffield 28537).

Tipton Tub & Tube Co. Ltd., Bloomfield Road, Tipton, Staffordshire (Tipton 1011 & 3418).

CHIMNEY THROAT RESTRICTORS FOR DOMESTIC CHIMNEYS

Lathe, Charles & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffs. (Tipton 1887). ("*Claco*" *solid fuel burning appliances.*)

CLEAN ROOMS

Air Movement Ltd., Central Design Office, Dover Road, Northfleet, Kent (Gravesend 64844). ("*Amaire*").

Bass, John, Ltd., B.M.B. Crawley Works, Fleming Way, Crawley, Sussex (Crawley 28765) (9 lines).

COAL HANDLING PLANT

Buell Ltd., 8-10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761).
Imperial Steel Works, Sheffield, 9 (Sheffield 49054).

Thompson, John (Triumph Stoker) Ltd., Triumph Works, Kirkstall Road, Leeds, 3, Lancashire (Leeds 34841). ("*Triumph*" *stokers.*)

COMBUSTION TESTING EQUIPMENT

Elliott Process Automation Ltd., Abbey Road, Park Royal, London, N.W.10 (ELGar 2111 & 7641).

Shandon Scientific Co. Ltd., 65 Pound Lane, London, N.W.10 (WILlesden 8671). ("*Fy-rite*" *CO_2 indicator,* "*True Spot*" *smoke tester,* "*MZF*" *draft gauge* "*Bacharach*" *combustion testing equipment.*)

CONTRACTORS, HEATING, VENTILATING AND AIR CONDITIONING

Andrews-Weatherfoil Ltd., Powell Duffryn House, 19 Berkeley Street, London, W.1 (HYDe Park 7010).
Turncroft Lane, Stockport, Cheshire (Stockport 3441).
Lambeg Mills, Lisburn, Co. Antrim, Northern Ireland (Dunmurry 2542/3).

Borsari & Co., Zollikon-Zurich, Switzerland (24 96 18). (*Underground fuel oil storage tanks of reinforced concrete.*)

Carrier Engineering Co. Ltd., Carrier House, Warwick Row, London, S.W.1 (VICtoria 6858).

Carrier-Ross Engineering Co. Ltd., 22a Cavendish Square, London, W.1 (MAYfair 2364/6).

Harrington, C. H. & Co. Ltd., 38/40 Howard Street and 15/17 Howard Lane, Sheffield, 1. (Sheffield 28537).

Hope's Heating & Engineering Ltd., Halford Works, Smethwick, Birmingham 40 (Smethwick 2191).
16 Berners Street, London, W.1 (MUSeum 8412).
8 Cumberland Road, Leeds (Leeds 5-6541 & 5-6555).
Splott Works, Walker Road, Cardiff (Cardiff 23581-2).
7 Pier Street, Hull (Hull Central 35346).

Howorth, James & Co. Ltd., Victoria Works, Farnworth, near Bolton, Lancashire, (Farnworth 1060-1).

Jackson, J. B., & Partners Ltd., Hardwick's Way, Wandsworth, London, S.W.18 (VANdyke 9081).

James, Richard (Westminster) Ltd., Ferry Works, Lacy Road, Putney, London, S.W.15 (PUTney 7792).

Midland Fabricators Co., 57 Penn Street, Birmingham, 4 (Aston Cross 1641). (*General sheet metal work, light gauge fabrications.*)

Morgan Air Treatments Ltd., 55/57 Salop Street, Birmingham 12 (Victoria 2096).

Rodway & Taylor (Birmingham) Ltd., 85-90 Buckingham Street, Birmingham, 19 (Central 4027-8). (*Dust, fume, ventilating and heating engineers.*)

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233). (*Plenum, tempered and filtered air supply, high and medium pressure hot water.*)

CONVECTORS

Ekco Heating & Electrical Ltd., 41/47 Old Street, London, E.C.2 (CLErkenwell 7142).

Lathe, Charles & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffs. (Tipton 1887). ("*Claco*" *solid fuel burning appliances.*)

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).
London showrooms: 229 Regent Street, London, W.1 (HYDe Park 7010).

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

Radiation Parkray Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

COOLERS

Buell Ltd., 8-10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761).
Imperial Steel Works, Sheffield, 9. (Sheffield 49054).

Carrier Engineering Co. Ltd., Carrier House, Warwick Row, London, S.W.1 (VICtoria 6858).

Heenan & Froude Ltd., Shrub Hill, Worcester (Worcester 23461) (14 lines).

Visco Ltd., Stafford Road, Croydon, Surrey (MUNicipal 3861). (10 lines).

DAMPERS

Combustion Equipment Ltd., 61 Belsize Lane, London, N.W.3 (SWIss Cottage 4462/3). (*Cory Grit arresters, aluminium cladding for chimneys. Dribore chimneys, Mark IV furnace baffle for shell boilers, waste material disposal furnaces.*)

Fairitt Engineering Co. Ltd., 101 Sandford Road, Moseley, Birmingham, 13. (SOUth 3651).
Sales Office: 24 Worple Road, Wimbledon, London, S.W.19 (LAKeside 1540) ("*Airmaster*").

DEHUMIDIFIERS

Carrier Engineering Co. Ltd., Carrier House, Warwick Row, London, S.W.1 (VICtoria 6858).

Heather Filters Limited, 7 Kendall Place Baker Street, London, W.1 (HUNter 1801). ("*Humexair*").

Lightfoot Refrigeration Co. Ltd., The, Abbeydale Road, Wembley, Middlesex (PERivale 3322).

DISCHARGE VALVES

Collectron Ltd., 32 Aylmer Road, Leytonstone, London, E.11 (LEYtonstone 3085 & 4709).
3 Brook Square, Rugeley, Staffordshire (Rugeley 659).
(*Continuous discharge valves.*)

Nailsea Engineering Co. Ltd., Samlesbury Airfield near Blackburn, Lancashire (Mellor 666). ("*Pnu-Jet*" *reverse jet filters and continuous discharge valves.*)

DUCT HEATERS

Airwoods Ltd., 66 Barrack Street, Colchester, Essex (Colchester 78484).

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).
London showrooms: 229 Regent Street, London, W.1 (HYDe Park 7010).

DUCTING

Bass, John, Ltd., B.H.B. Crawley Works, Fleming Way, Crawley, Sussex. (Crawley 28765) (9 lines).

Bell Bros. (Pudsey) Ltd., Green Lane, Smalewell Road, Pudsey, Yorkshire (Pudsey 5715/6).

Binner, T. G. (Boilers) Ltd., New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

Hainault Engineering Co. Ltd., Fowler Road, Hainault, Essex (Hainault 4426).
21 Evesham Avenue, Whitley Bay, Northumberland (20588).
("*Hainault*" *industrial oil-fired air heaters.*)

Harrington, C. H. & Co. Ltd., 38/40 Howard Street and 15/17 Howard Lane, Sheffield, 1. (Sheffield 28537).

Hetedaire-Carricks Ltd., Faraday Road, Eastwood Industrial Estate, Leigh-on-Sea, Essex (Southend-on-Sea 524351/2).

Jukes, Frederick, Ltd., Royston Works, Garth Road, Lower Morden, Surrey (DERwent 2282).

Midland Fabricators Co., 57 Penn Street, Birmingham, 4 (Aston Cross 1641). (*General sheet metal work, light gauge fabrications*).

Modern Air Systems (Leicester) Ltd., 127 Barkby Road, Leicester (Leicester 67591/2).

Radiation Central Heating Ltd., Radiation House, North Circular Road, London, N.W.10. (WILlesden 1234).

Tipton Tub & Tube Co. Ltd., Bloomfield Road, Tipton, Staffordshire (Tipton 1011 & 3418).

Wright & Summerhill Ltd., Lupton Street, Leeds, 10 (Leeds 75434/5). (*Sheet metal, ventilating and light constructional engineers,* "*Ventwright*" *canopies, incorporating fans, filters, grilles, louvres, etc.*)

DUST CLASSIFICATION PLANT

Buell Ltd., 8-10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761).
Imperial Steel Works, Sheffield, 9 (Sheffield 49054).

DUST COLLECTING EQUIPMENT

Dust Control Equipment Ltd., Thurmaston, Leicester (Syston 3333) ("*Drytex*" *and* "*Unimaster*" *dust control units:* "*Dalamatic*" *automatic and* "*Drytube*" *dust filters:* "*Multiswirl*" *wet dedusters.*)

DUST COLLECTING PLANT

Air Control Installations Ltd., Victoria Road, Ruislip, Middlesex (VIKing 1222).
Wolverley House, Digbeth, 5 (Midland 5148).
70 Mosley Street, Manchester, 2 (Central 0679).
Cross House, Westgate Road, Newcastle-upon-Tyne, 1 (28861).
701 Sauchiehall Street, Glasgow, C.3 (City 7281).

Alldays & Onions Ltd., P.O. Box 234, Great Western Works, Sydenham Road, Birmingham, 11 (Vic. 2251/4).

Ambuco Ltd., 49 Moorgate, London, E.C.2 (METropolitan 9242/4).
Dron & Dickson Ltd., 158 Bath Street, Glasgow, C.2 (Douglas 1337). (*Ambuco Cyclones, scrubbers and fabric arresters*).

Andrews-Weatherfoil Ltd., Powell Duffryn House, 19 Berkeley Street, London, W.1 (HYDe Park 7010).
Turncroft Lane, Stockport, Cheshire (Stockport 3441).
Lambeg Mills, Lisburn, Co. Antrim, Northern Ireland (Dunmurry 2542/3).

Bell Bros. (Pudsey) Ltd., Green Lane, Smalewell Road, Pudsey, Yorkshire (Pudsey 5715/6).

Bigwood, Joshua & Son Ltd., Wednesfield Road, Wolverhampton (Wolverhampton 24771).

British Vacuum Cleaner & Engineering Co. Ltd., Goblin Works, Leatherhead, Surrey (Ashtead 6121).

Buell Ltd., 8-10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761).
Imperial Steel Works, Sheffield, 9 (Sheffield 49054).

Chemical Construction (G.B.) Ltd., 9 Henrietta Place, London, W.1 (LANgham 6571). ("*Chemico*"—*Pease Anthony Venturi scrubbers*).

Collectron Ltd., 32 Aylmer Road, Leytonstone, London, E.11 (LEYtonstone 3085 & 4709).
3 Brook Square, Rugeley, Staffordshire. (Rugeley 659). ("*Collectron*" *dust collectors.*)

Collins, Newton Ltd., Barford Street Works, Birmingham, 5 (Midland 3670). ("*Dustrol*".)

Combustion Equipment Ltd., 61 Belsize Lane, London, N.W.3 (SWIss Cottage 4462/3). *Cory grit arresters, aluminium cladding for chimneys. Dribore chimneys. Mark IV furnace baffle for shell boilers, waste material disposal furnaces.*)

Dunford & Elliott Process Engineering Ltd., 143 Maple Road, Surbiton, Surrey (KINgston 7799). (*Dust control and collection systems*).

Fan Systems Ltd., 2 Brazil Street, Manchester, 1 (Central 7156/7/8). (*Fans and ancillary equipment.*)

Green, E. & Son Ltd., Calder Vale Road, Wakefield, Yorks. (Wakefield 71171). (*Paraclone dust collectors, Green's economiser.*)

Heat Economy Ltd., 13 Kentish Town Road, London, N.W.1 (GULliver 1233 & 2512).

Howorth, James, & Co. Ltd., Victoria Works, Farnworth, near Bolton, Lancashire (Farnworth 1060-1).

Incandescent Ltd., Cornwall Road, Smethwick, 40, Staffordshire (Smethwick 2121). (*Incandescent-Whiting Dust Collectors for cupolas.*)

Industrial & Metallurgical Equipment Ltd., Moor House, London Wall, London, E.C.2 (METropolitan 0471). ("*Elbair*" *gas cleaning system.*)

Jukes, Frederick Ltd., Royston Works, Garth Road, Lower Morden, Surrey (DERwent 2282).

Lodge-Cottrell Ltd., George Street Parade, Birmingham, 3 (Central 3388). (*Electrical precipitation*).

Midland Fabricators Co., 57 Penn Street, Birmingham, 4 (Aston Cross 1641). (*General sheet metal work, light gauge fabrications*).

Modern Air Systems (Leicester) Ltd., 127 Barkby Road, Leicester (Leicester 67591/2).

Morgan Air Treatments Ltd., 55/57 Salop Street, Birmingham, 12 (Victoria 2096).

Musgrave & Co. Ltd., St. Ann's Works, Belfast, 5 (Belfast 59411) (8 lines).
9 Coombe Road, New Malden, Surrey (Malden 1145).

Nailsea Engineering Co. Ltd., Samlesbury Airfield, near Blackburn, Lancashire (Mellor 666). ("*Pnu-jet*" *reverse jet filters.*)

Richardson, R. J. & Sons Ltd., Engineering & Shotblast Works, 37 Commercial Street, Birmingham, 1 (Midland 2281 P.B.X.). (*Dust extraction and high efficiency collecting, ultra filtration, electrostatic precipitation, super drying of atmospheric air, high temperature fume control and collection.*)

Rodway & Taylor (Birmingham) Ltd., 85-90 Buckingham Street, Birmingham, 19 (Central 4027-8). (*Dust, fume, ventilating and heating engineers*).

Spencer & Halstead Ltd., Bridge Works, Ossett, Yorkshire (Ossett 821). ("*Spenstead.*")

Steam & Power Development Co. Ltd., 190 Wolverhampton Street, Dudley, Worcestershire (Dudley 53548).

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233). (*Electrostatic precipitators, scrubbers, textile filters, cyclones.*)

Tilghmans Ltd., Broadheath, Altrincham, Cheshire (Altrincham 4242) (9 lines).

Tipton Tub & Tube Co. Ltd., Bloomfield Road, Tipton, Staffordshire (Tipton 1011 & 3418).

Visco Ltd., Stafford Road, Croydon, Surrey (MUNicipal 3861) (10 lines).

DUST SAMPLING EQUIPMENT

Casella, C. F. & Co. Ltd., Regent House, Britannia Walk, London, N.1 (CLErkenwell 8581/7). (*Scientific and meteorological instruments.*)

Elliott Process Automation Ltd., Abbey Road, Park Royal, London, N.W.10 (ELGar 2111 & 7641).

Fleming Instruments Ltd., Caxton Way, Stevenage, Hertfordshire (Stevenage 804).

ECONOMISERS, FUEL

Combustion Equipment Ltd., 61 Belsize Lane, London, N.W.3 (SWIss Cottage 4462/3). (*Cory grit arresters, aluminium cladding for chimneys, Dribore chimneys, Mark IV furnace baffle for shell boilers, waste material disposal furnaces.*)

Green, E. & Son Ltd., Calder Vale Road, Wakefield, Yorks. (Wakefield 71171). (*Paraclone dust collectors; Green's economiser.*)

ELECTRIC HEATING EQUIPMENT

Catterson-Smith, R. M. Ltd., Adams Bridge Works, Exhibition Grounds, Wembley, Middlesex (WEMbley 4291). (*Electric furnaces and ovens.*)

Ekco Heating & Electrical Ltd., 41/47 Old Street, London, E.C.2 (CLErkenwell 7142).

Frost, H. & Co. Ltd., New Street (Fieldgate), Walsall, Staffs. (Walsall 25551).

Heys, Leonard Ltd., Faraday House, Henry Street, Blackpool, Lancs. (Blackpool 46363, Telex 67636).

Isopad Ltd., Barnet-By-Pass, Boreham Wood, Herts. (ELStree 2817-18-19-10).

Lesser, David C. & Co. Ltd., Vernon House, 510a Coventry Road, Birmingham, 10 (VICtoria 2221). (*"Lestric" and "Priory" electric fires, fan heaters, towel rails.*)

Lucas Industrial Equipment Ltd., Hargher Clough Works, Burnley, Lancashire (Burnley 5051) (*"Climatrix" electrical central heating units and domestic electrical heating appliances. "Climastor" unit storage heaters.*)

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).
London showrooms: 229 Regent Street, London, W.1 (HYDe Park 7010).

ELECTRIC UNIT STORAGE HEATERS

Ekco Heating & Electrical Ltd., 41/47 Old Street, London, E.C.2 (CLErkenwell 7142).

Lucas Industrial Equipment Ltd., Hargher Clough Works, Burnley, Lancashire (Burnley 5051). (*"Climastor" 2½kW domestic, 12kW ducted warm air for central heating.*)

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).
London showrooms: 229 Regent Street, London, W.1 (HYDe Park 7010).

ELECTRICAL PRECIPITATORS

Head Wrightson Iron & Steel Works Engineering Ltd., Teesdale Ironworks, Thornaby-on-Tees, Yorkshire. (Stockton 62241).

Locker Industries (Sales) Ltd., Church Street, Warrington, Lancashire (Warrington 34111).
London Office: Clune House, Surrey Street, Strand, London, W.C.2 (TEMple Bar 4059/8559).

Lodge-Cottrell Ltd., George Street Parade, Birmingham, 3 (Central 3388). (*Electrical precipitation.*)

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233).

EXHIBITION AND DISPLAY CONTRACTORS

Autur Display Organisation Ltd., 66 St. Paul Street, Islington, London, N.1 (CANonbury 7727). (*Official stand contractors for National Clean Air Exhibition since* 1960.)

Central Display Co. Ltd., 47-49 Bendon Valley, Earlsfield, London, S.W.18 (VANdyke 8044/7).

Princedale Electrical Co. Ltd., 205 Warwick Road, Kensington, London, W.14 (WEStern 3727/8). (*Official Electrical Contractors, National Clean Air Exhibition,* 1963 *and* 1964.)

EXTRACTOR FANS (DOMESTIC)

Ekco Heating & Electrical Ltd., 41/47 Old Street, London, E.C.2 (CLErkenwell 7142).

FANS

Air Control Installations Ltd., Victoria Road. Ruislip, Middlesex (VIKing 1222).
Wolverley House, Digbeth 5 (Midland 5148),
70 Mosley Street, Manchester, 2 (Central 0679).
Cross House, Westgate Road, Newcastle-upon-Tyne, 1 (28861).
701 Sauchiehall Street, Glasgow, C.3 (City 7281).

Alldays & Onions Ltd., P.O. Box 234, Great Western Works, Sydenham Road, Birmingham, 11 (Vic. 2551/4).

Bass, John, Ltd., B.M.B. Crawley Works, Fleming Way, Crawley, Sussex (Crawley 28765) (9 lines).

British Vacuum Cleaner & Engineering Co. Ltd., Goblin Works, Leatherhead, Surrey (Ashtead 6121).

Davidson & Co. Ltd., Sirocco Engineering Works, Belfast, 5, Northern Ireland (Belfast 57251). ("*Sirocco*").

Fan Systems Ltd., 2 Brazil Street, Manchester, 1 (Central 7156/7/8). (*Fans and ancillary equipment.*)

Harrington, C. H. & Co., Ltd., 38/40 Howard Street and 15/17 Howard Lane, Sheffield, 1 (Sheffield 28537).

Matthews & Yates Ltd., Cyclone Works, Swinton, Manchester (Swinton 2273).

Modern Air Systems (Leicester) Ltd., 127 Barkby Road, Leicester (Leicester 67591/2).

Musgrave & Co. Ltd., St. Ann's Works, Belfast, 5 (Belfast 59411) (8 lines).
9 Coombe Road, New Malden, Surrey (Malden 1145).

Spencer & Halstead Ltd., Bridge Works, Ossett, Yorkshire (Ossett 821). ("*Spenstead.*")

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233).

"FIBERGLAS" U.K. DISTRIBUTORS

Chemical Trading Co. Ltd., Cree House, 18-20, Creechurch Lane, London, E.C.3 (AVEnue 5488).

FILTERS, AIR

Air Control Installations Ltd., Victoria Road, Ruislip, Middlesex (VIKing 1222).
Wolverley House, Digbeth, 5 (Midland 5148).
70 Mosley Street, Manchester, 2 (Central 0679).
Cross House, Westgate Road, Newcastle-upon-Tyne (28861).
701 Sauchiehall Street, Glasgow, 3 (City 7281).

Birfield Filtration Ltd., Bradford Street, Birmingham, 5 (MIDland 7961). ("*Far-Air*" *filters*)

British Vacuum Cleaner & Engineering Co. Ltd., Goblin Works, Leatherhead, Surrey (Ashtead 6121).

Delbag Air Filters Ltd., 15 Kensington High Street, London, W.8 (WEStern 5651).

Harrington, C. H. & Co. Ltd., 38/40 Howard Street and 15/17 Howard Lane, Sheffield, 1 (Sheffield 28537).

Heather Filters Limited, 7 Kendall Place, Baker Street, London, W.1 (HUNter 1801). (*Multi-brush*).

Howorth, James & Co. Ltd., Victoria Works, Farnworth, near Bolton, Lancashire (Farnworth 1060-1).

Jukes, Frederick Ltd., Royston Works, Garth Road, Lower Morden, Surrey (DERwent 2282).

Locker Industries (Sales) Ltd., Church Street, Warrington, Lancashire (Warrington 34111).
London Office: Clune House, Surrey Street, Strand, London, W.C.2.

Luwa (U.K.) Ltd., Reliance House, 340 Clapham Road, London, S.W.9 (MACauley 0333).

Matthews & Yates Ltd., Cyclone Works, Swinton, Manchester (Swinton 2273).

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233). (*Electrostatic, viscous fabric.*)

Tilghmans Ltd., Broadheath, Altrincham, Cheshire (Altrincham 4242) (9 lines) (*Electrostatic and ultrafiltration.*)

Visco Ltd., Stafford Road, Croydon, Surrey (MUNicipal 3861) (10 lines).

FIRE BRIDGES

Halliwell Furnace & Engineering Co. Ltd., 56 Chapel Street, Luton, Bedfordshire (Luton 23374). ("*Effeco*" *smoke consuming fire bridge.*)

FIRE LIGHTERS (ELECTRIC)

Best Products Ltd., Ranelagh House, Felixstowe, Suffolk (Felixstowe 3154/5/6). ("*Matchless*" *electric firelighter.*)

FIRE-LIGHTERS (GAS)

Baxi, Richard Baxendale & Sons, Bamber Bridge, Preston, Lancashire (Preston 85271).

FLOOR HEATING

James, Richard (Westminster) Ltd., Ferry Works, Lacy Road, Putney, London, S.W.15 (PUTney 7792). (*Embedded hot water systems.*)

FLUE ASH AND CLINKER CONVEYING PLANT

Babcock & Wilcox Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321).

British Vacuum Cleaner & Engineering Co. Ltd., Goblin Works, Leatherhead, Surrey (Ashtead 6121).

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233).

Thompson, John (Triumph Stoker), Ltd., Triumph Works, Kirkstall Road, Leeds, 3 (Leeds 34841). ("*Triumph*" *Stokers.*)

FLUE DUST EXTRACTION PLANT

Buell Ltd., 8-10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761).
Imperial Steel Works, Sheffield, 9 (Sheffield 49054).

Davidson & Co. Ltd., Sirocco Engineering Works, Belfast, 5, Northern Ireland (Belfast 57251). ("*Sirocco*".)

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233) (*Pneumatic.*)

FLUE GAS DUST MONITORING DEVICE (C.E.G.B. TYPE)

Airflow Developments Ltd., Lancaster Road, High Wycombe, Bucks. (High Wycombe 5252/4).

Fleming Instruments Ltd., Caxton Way, Stevenage, Hertfordshire (Stevenage 804).

FLUE GAS DUST SAMPLING EQUIPMENT (B.C.U.R.A. TYPE)

Airflow Developments Ltd., Lancaster Road, High Wycombe, Bucks. (High Wycombe 5252/4).

FLUE GAS TREATMENT

D.C.P. Systems Ltd., 5 Petty France, London, S.W.1 (WHItehall 8841). (*D.C.P.*)

FLUE HEATERS, BALANCED

Borchardt, F. A. Ltd., Water Lane, Exeter, Devon (Exeter 74064).
486 High Road, Chiswick, London, W.4 (CHIswick 0840).

FUEL EFFICIENCY ADVISORY SERVICE

National Industrial Fuel Efficiency Service, The, 71 Grosvenor Street, London, W.1 (HYDe Park 9706).

FUEL OIL STORAGE TANKS (MILD STEEL)

Binner, T. G. (Boilers) Ltd., New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

FUEL OIL STORAGE TANKS (REINFORCED CONCRETE)

Borsari & Co., Zollikon-Zurich, Switzerland (24 96 18).

FUME REMOVAL EQUIPMENT

Air Control Installations Ltd., Victoria Road, Ruislip, Middlesex (VIKing 1222).
Wolverley House, Digbeth 5 (Midland 5148).
70 Mosley Street, Manchester, 2 (Central 0679).
Cross House, Westgate Road, Newcastle-upon-Tyne, 1 (28861).
701 Sauchiehall Street, Glasgow, C.3 (City 7281).

Ambuco Ltd., 49 Moorgate, London, E.C.2 (METropolitan 9242/4).
Dron & Dickson Ltd., 158 Bath Street, Glasgow, C.2 (Douglas 1337). (*Ambuco cyclones, scrubbers and fabric arresters*).

Bell Bros. (Pudsey) Ltd., Green Lane, Smalewell Road, Pudsey, Yorkshire (Pudsey 5715/6).

Chemical Construction (G.B.) Ltd., 9 Henrietta Place, London, W.1 (LANgham 6571). ("*Chemico*"—*Pease Anthony Venturi scrubbers*).

Collins, Newton Ltd., Barford Street Works, Birmingham, 5 (Midland 3670). ("*Dustrol*").

Fan Systems Ltd., 2 Brazil Street, Manchester, 1 (Central 7156/7/8). (*Fans and ancillary equipment.*)

Harrington, C. H. & Co. Ltd., 38/40 Howard Street and 15/17 Howard Lane, Sheffield, 1. (Sheffield 28537).

Head Wrightson Iron & Steel Works Engineering Ltd., Teesdale Ironworks, Thornaby-on-Tees, Yorkshire. (Stockton 62241).

Jukes, Frederick Ltd., Royston Works, Garth Road, Lower Morden, Surrey (DERwent 2282).

Marshall & Parsons Ltd., 1111 London Road, Leigh-on-Sea, Essex (Southend 74867). ("*Draught-Master*" *automatic one-way air inlet;* "*Flue-Master*" *automatic one-way air intake.*)

Matthews & Yates Ltd., Cyclone Works, Swinton, Manchester (Swinton 2273).

Midland Fabricators Co., 57 Penn Street, Birmingham, 4 (Aston Cross 1641). (*General sheet metal work, light gauge fabrication.*)

Modern Air Systems (Leicester) Ltd., 127 Barkby Road, Leicester (Leicester 67591/2.).

Morgan Air Treatments Ltd., 55/57 Salop Street, Birmingham, 12 (Victoria 2096).

Musgrave & Co. Ltd., St. Ann's Works, Belfast, 5 (Belfast 59411) (8 lines).
9 Coombe Road, New Malden, Surrey (Malden 1145).

Richardson, R. J. & Sons Ltd., Engineering and Shotblast Works, 37 Commercial Street, Birmingham, 1 (Midland 2281 PBX). (*Dust extraction and high efficiency collecting. Ultra filtration, Electrostatic precipitation, super drying of atmospheric air, high temperature fume control and collection.*)

Spencer & Halstead Ltd., Bridge Works, Ossett, Yorkshire (Ossett 821). ("*Spenstead.*")

Steam & Power Development Co. Ltd., 190 Wolverhampton Street, Dudley, Worcestershire (Dudley 53548). (*Condensing fume cleaning.*)

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233). (*Electrostatic precipitators, scrubbers, fabric filters.*)

Visco Ltd., Stafford Road, Croydon, Surrey (MUNicipal 3861) (10 lines).

Wright & Summerhill Ltd., Lupton Street, Leeds, 10 (Leeds 75434/5). (*Sheet metal, ventilating and light constructional engineers, "Ventwright" canopies, incorporating fans, filters, grilles, louvres, etc.*)

FURNACES, KILNS, OVENS ETC.

Catterson-Smith Ltd., Adams Bridge Works, Exhibition Grounds, Wembley, Middlesex (Wembley 4291). (*Electric furnaces and ovens.*

Heat Economy Ltd., 13 Kentish Town Road, London, N.W.1 (GULliver 1233/2512).

Neil, W. & Co. Ltd., 14a Hog Hill Road, Collier Row, Romford, Essex (Romford 61958).

Premier Oil Burners, Hednesford Road, Heath Hayes, Cannock, Staffs (Heath Hayes 296-297). (*Oil-firing equipment manufacturers.*)

Radiant-Heating Ltd., 475 Foleshill Road, Coventry (Coventry 88655). (*Special furnaces.*)

Rider, G. F. (Process Plant) Ltd., 59-61 Tollington Park, London, N.4 (ARChway 0404).

GAS CLEANING PLANT

Head Wrightson Iron & Steel Works Engineering Ltd., Teesdale Ironworks, Thornaby-on-Tees, Yorkshire. (Stockton 62241).

Lodge-Cottrell Ltd., George Street Parade, Birmingham, 3 (Central 3388). (*Electrical precipitation.*)

Musgrave & Co. Ltd., St. Ann's Works, Belfast, 5 (Belfast 59411) (8 lines).
9 Coombe Road, New Malden, Surrey (Malden 1145).

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233) (*Electrostatic Precipitators, scrubbers, mechanical collectors, fabric filters.*)

GAS HEATING EQUIPMENT

Airwoods Ltd., 66 Barrack Street, Colchester, Essex (Colchester 78484).

Borchardt, F. A. Ltd., Water Lane, Exeter, Devon (Exeter 74064).
486 High Road, Chiswick, London, W.4 (CHIswick 0840).

Potterton, Thomas Ltd., 20/30 Buckhold Road, London, S.W.18 (VANdyke 7202). ("*Potterton*" *and* "*Diplomat*".)

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).
London showrooms: 229 Regent Street, London, W.1 (HYDe Park 7010).

Radiant-Heating Ltd., 475 Foleshill Road, Coventry (Coventry 88655).

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

GAS HEATING EQUIPMENT (BUTANE/PROPANE)

Airwoods Ltd., 66 Barrack Street, Colchester, Essex (Colchester 78484).

Borchardt, F. A. Ltd., Water Lane, Exeter, Devon (Exeter 74064).
486 High Road, Chiswick, London, W.4 (CHIswick 0840).

Radiant-Heating Ltd., 475 Foleshill Road, Coventry (Coventry 88655).

GAS SCRUBBERS AND WASHERS

Chemical Construction (G.B.) Ltd., 9 Henrietta Place, London, W.1 (LANgham 6571). ("*Chemico*"—*Pease Anthony Venturi Scrubbers.*)

Head Wrightson Iron & Steel Works Engineering Ltd., Teesdale Ironworks, Thornaby-on-Tees, Yorkshire. (Stockton 62241).

GAS SUPPLY (MAINS)

Gas Council, The, Murdoch House, 1 Grosvenor Place, London, S.W.1 (BELgravia 4321).
Scottish Gas Board, 26 Drumsheugh Gardens, Edinburgh, 3 (Caledonian 2052/7).
Northern Gas Board, 30 Grainger Street, Newcastle-upon-Tyne (26101).
North Western Gas Board, Bridgewater House, 60 Whitworth Street, Manchester, 1 (Central 8121).
North Eastern Gas Board, Bridge Street, Leeds (32571/8).
East Midlands Gas Board, Beverley House, University Road, Leicester (50022).
West Midlands Gas Board, Wharf Lane, Solihull, Warwickshire (Solihull 4861).
Wales Gas Board, Snelling House, Bute Terrace, Cardiff (Cardiff 33131).
Eastern Gas Board, Sun Building, Clarendon Road, Watford (28555).
North Thames Gas Board, 30 Kensington Church Street, London, W.8 (WEStern 8141).
South Eastern Gas Board, Katharine Street, Croydon, Surrey (4466).
Southern Gas Board, 164 Above Bar, Southampton (Southampton 75544).
South Western Gas Board, 9a Quiet Street, Bath (60411).

GAS SUPPLY (LIQUEFIED PETROLEUM)

Calor Gas (Distributing) Co. Ltd., 178-202 Gt. Portland Street, London, W.1 (LANgham 0351).
Calor Gas (Scotland) Ltd., 11-15 Westwood Road, Pollokshaws, Glasgow, S.3.
Calor Gas (Scotland) Ltd., Lockview Road, Stranmillis, Belfast. (*Calor Gas, Calor Propane*).

GRILLES, LOUVRES, ETC.

Air Distribution Equipment Ltd., Bentinck Road, West Drayton, Middlesex (West Drayton 2687). ("*Titus*" *aluminium grilles, louvres, etc.*)

GRIT ARRESTERS

Alldays & Onions Ltd., P.O. Box 234, Great Western Works, Sydenham Road, Birmingham, 11 (Victoria 2251/4).

Ambuco Ltd., 49 Moorgate, London, E.C.2 (METropolitan 9242/4).
Dron & Dickson Ltd., 158 Bath Street, Glasgow, C.2 (Douglas 1337). (*Ambuco cyclones, scrubbers and fabric arresters.*)

Bigwood, Joshua & Son Ltd., Wednesfield Road, Wolverhampton (Wolverhampton 24771).

Buell Ltd., 8-10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761).
Imperial Steel Works, Sheffield, 9 (Sheffield 49054).

Collectron Ltd., 32 Aylmer Road, Leytonstone, London, E.11 (LEYtonstone 3085 & 4709).
3 Brook Square, Rugeley, Staffordshire. (Rugeley 659). ("*Collectron*" *grit arresters.*)

Combustion Equipment Ltd., 61 Belsize Lane, London, N.W.3 (SWIss Cottage 4462/3). (*Cory grit arresters, aluminium cladding for chimneys; Dribore chimneys; Mark IV furnace baffle for shell boilers; waste material disposal furnaces.*)

Dunford & Elliott Process Engineering Ltd., 143 Maple Road, Surbiton, Surrey (KINgston 7799). (*Dust control and collection systems*).

Fan Systems Ltd., 2 Brazil Street, Manchester, 1 (Central 7156/7/8). (*Fans and ancillary equipment.*)

E. Green & Son Ltd., Calder Vale Road, Wakefield, Yorks. (Wakefield 71171). (*Paraclone dust collectors, Green's economiser.*)

Heat Economy Ltd., 13 Kentish Town Road, London, N.W.1 (GULliver 1233/2512).

Incandescent Ltd., Cornwall Road, Smethwick 40, Staffordshire (Smethwick 2121). (*Incandescent-Whiting Dust Collectors for cupolas.*)

Musgrave & Co. Ltd., St. Ann's Works, Belfast, 5 (Belfast 59411) (8 lines).
9 Coombe Road, New Malden, Surrey (Malden 1145).

Rodway & Taylor (Birmingham) Ltd., 85-90 Buckingham Street, Birmingham, 19 (Central 4027-8). (*Dust, fume, ventilating and heating engineers.*)

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233). (*Electrostatic precipitators, mechanical collectors, scrubbers, fabric filters.*)

Tipton Tub & Tube Co. Ltd., Bloomfield Road, Tipton, Staffordshire (Tipton 1011/3418).

HEAT EXCHANGERS

C.T.C. (Heat) London Ltd., 17 Sloane Street, London, S.W.1 (BELgravia 3478/6286).

Luwa (U.K.) Ltd., Reliance House, 340 Clapham Road, London, S.W.9 (MACauley 0333).

HEATERS, AIR

Airwoods Ltd., 66 Barrack Street, Colchester, Essex (Colchester 78484).

Carrier-Ross Engineering Co. Ltd., 22a Cavendish Square, London, W.1 (MAYfair 2364/6).

Clyde Fuel Systems Ltd., Queen Elizabeth Avenue, Hillington, Glasgow, S.W.2 (Halfway 3291) (8 lines).

Hainault Engineering Co. Ltd., Fowler Road, Hainault, Essex (Hainault 4426/8).
21 Evesham Avenue, Whitley Bay, Northumberland (20588). (*Hainault industrial oil-fired air heaters.*)

Hetedaire-Carricks Ltd., Faraday Road, Eastwood Industrial Estate, Leigh-on-Sea, Essex (Southend-on-Sea 524351/2).

Luwa (U.K.) Ltd., Reliance House, 340 Clapham Road, London, S.W.9 (MACauley 0333).

Matthews & Yates Ltd., Cyclone Works, Swinton, Manchester (Swinton 2273).

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).
London Showrooms: 229 Regent Street, London, W.1 (HYDe Park 7010).

Radiation Parkray Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

Wanson Co. Ltd., 7 Elstree Way, Borehamwood, Herts. (Elstree 5696). ("*Thermobloc*" *direct-fired air heaters.*)

HEATERS, ELECTRIC (FUEL EFFECT)

Frost, H. & Co. Ltd., New Street, Fieldgate, Walsall, Staffordshire (Walsall 25551).

HEATERS, FAN

Frost, H. & Co. Ltd., New Street, Fieldgate, Walsall, Staffordshire (Walsall 25551).

HEATERS, INFRA-RED

Frost, H. & Co. Ltd., New Street, Fieldgate, Walsall, Staffordshire (Walsall 25551).

HEATERS, LIQUID PHASE

Stone J. & Co. (Deptford) Ltd., Arklow Road, London, S.E.14 (TIDeway 1202). ("*Stone-Vapor*")

HEATERS, WALL PANEL

Frost, H. & Co. Ltd., New Street, Fieldgate, Walsall, Staffordshire (Walsall 25551).

HEATERS, WATER

Lathe, Charles & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffs. (Tipton 1887). ("*Claco*" *solid fuel burning appliances.*)

Norel Electrical Appliances Ltd., 185 Hammersmith Road, London, W.6 (RIVerside 2368/8382). (*Norel electric radiators and water heaters.*)

Radiation Parkray Ltd., Radiation House, North Circular Road, London, N.W.10 WILlesden 1234).

HEATING EQUIPMENT, DOMESTIC

Baxi, Richard Baxendale & Sons, Bamber Bridge, Preston, Lancashire (Preston 85271). ("*Baxi.*" *patent under-floor draught fire, open fire and gas warm air central heating systems.*)

Borchardt, F. A. Ltd., Water Lane, Exeter, Devon (Exeter 74064).
486 High Road, Chiswick, London, W.4 (CHIswick 0840).

British Coking Industry Association, 74 Grosvenor Street, London, W.1 (MAYfair 9736). ("*Sunbrite*" *solid fuel*).

BM Controls, 36 Kingston Road, Staines, Middlesex (Staines 51166). ("*BM*" *oil control valves, oil lifters, etc.*)

Ekco Heating & Electrical Ltd., 41/47 Old Street, London, E.C.2 (CLErkenwell 7142).

Frost, H. & Co. Ltd., New Street (Fieldgate), Walsall, Staffs. (Walsall 25551). (*Electric.*)

Grahamston Iron Co. Ltd., P.O. Box No. 5, Grahamston Iron Works, Falkirk, Stirlingshire (Falkirk 22661). (*Continuous burning inset open fires, underfloor draught fires, room heaters and convector heaters.*)

Lathe, Charles & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffs. (Tipton 1887). ("*Claco*" *solid fuel burning appliances.*)

Lesser, David C., & Co. Ltd., Vernon House, 510a Coventry Road, Birmingham, 10 (VICtoria 2221). ("*Lestric*" *and* "*Priory*" *electric fires, fan heaters, towel rails.*)

Lucas Industrial Equipment Ltd., Hargher Clough Works, Burnley, Lancashire (Burnley 5051). ("*Climatrix*" *and* "*Climastor*" *electrical central heating units and heating appliances.*)

Morphy-Richards (Cray) Ltd., 80/82, Pall Mall, London, S.W.1 (WHItehall 9755). ("*Morphy-Richards*" *domestic electric appliances.*)

Norel Electrical Appliances Ltd., 185 Hammersmith Road, London, W.6 (RIVerside 2368/8382). (*Norel electric radiators and water heaters.*)

Potterton, Thomas Ltd., 20/30 Buckhold Road, London, S.W.18 (VANdyke 7202). ("*Potterton*" *gas and oil-fired, &* "*Diplomat*" *oil-fired.*)

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).
London showrooms: 229 Regent Street, London, W.1 (HYDe Park 7010).

Radiation Central Heating Ltd., Radiation House, North Circular Road, London, N.W.10. (WILlesden 1234).

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

Radiation Parkray Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

HEATING EQUIPMENT, INDUSTRIAL (PROCESS)

Airwoods Ltd., 66 Barrack Street, Colchester, Essex (Colchester 78484).

Babcock & Wilcox Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321). ("*Babcock.*")

Calor Gas (Distributing) Co. Ltd., 178-202 Great Portland Street, London, W.1 (LANgham 0351).
Calor Gas (Scotland) Ltd., 11-15 Westwood Road, Pollokshaws, Glasgow, S.3.
Calor Gas (Scotland) Ltd., Lockview Road, Stranmillis, Belfast. (*Calor Gas; Calor Propane.*)

Carrier-Ross Engineering Co. Ltd., 22a Cavendish Square, London, W.1 (MAYfair 2364/6).

Catterson-Smith, R. M. Ltd., Adams Bridge Works, Exhibition Grounds, Wembley, Middlesex (Wembley 4291). (*Electric furnaces and ovens.*)

Clyde Fuel Systems Ltd., Queen Elizabeth Avenue, Hillington, Glasgow, S.W.2 (Halfway 3291) (8 lines).

Hetedaire-Carricks Ltd., Faraday Road, Eastwood Industrial Estate, Leigh-on-Sea, Essex (Southend-on-Sea 524351/2).

Isopad Ltd., Barnet-By-Pass, Boreham Wood, Herts. (Elstree 2817-18-19-10).

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).
London showrooms: 229 Regent Street, London, W.1 (HYDe Park 7010).

Radiant-Heating Ltd., 475 Foleshill Road, Coventry (Coventry 88655).

Spencer & Halstead Ltd., Bridge Works, Ossett, Yorkshire (Ossett 821). ("*Spenstead.*")

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233). (*High pressure hot water.*)

HEATING EQUIPMENT, INDUSTRIAL (SPACE)

Airwoods Ltd., 66 Barrack Street, Colchester, Essex (Colchester 78484).

Borsari & Co., Zollikon-Zurich, Switzerland (24 96 18). (*Underground fuel oil storage tanks of reinforced concrete.*)

Borchardt, F. A. Ltd., Water Lane, Exeter, Devon (Exeter 74064).
486 High Road, Chiswick, London, W.4 (CHIswick 0840).

Calor Gas (Distributing) Co. Ltd., 178-202 Great Portland Street, London, W.1 (LANgham 0351).
Calor Gas (Scotland) Ltd., 11-15 Westwood Road, Pollokshaws, Glasgow, S.3.
Calor Gas (Scotland) Ltd., Lockview Road, Stranmillis, Belfast. (*Calor Gas; Calor Propane*).

Carrier Engineering Co. Ltd., Carrier House, Warwick Row, London, S.W.1 (VICtoria 6858).

Carrier-Ross Engineering Co. Ltd., 22a Cavendish Square, London, W.1 (MAYfair 2364/6).

Clyde Fuel Systems Ltd., Queen Elizabeth Avenue, Hillington, Glasgow, S.W.2 (Halfway 3291) (8 lines).

Ekco Heating & Electrical Ltd., 41/47 Old Street, London, E.C.2 (CLErkenwell 7142).

Hetedaire-Carricks Ltd., Faraday Road, Eastwood Industrial Estate, Leigh-on-Sea, Essex (Southend-on-Sea 524351/2).

Howorth, James & Co. Ltd., Victoria Works, Farnworth, near Bolton, Lancashire (Farnworth 1060/1).

Lucas Industrial Equipment Ltd., Hargher Clough Works, Burnley, Lancashire (Burnley 5051). ("*Climatrix*" *electrical central heating units,* "*Climasol*" *heat pumps.*)

Luwa (U.K.) Ltd., Reliance House, 340 Clapham Road, London, S.W.9 (MACauley 0333).

Matthews & Yates Ltd., Cyclone Works, Swinton, Manchester (Swinton 2273).

Potterton, Thomas Ltd., 20/30 Buckhold Road, London, S.W.18 (VANdyke 7202). ("*Potterton*" *and* "*Diplomat*".)

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).
London showrooms: 229 Regent Street, London, W.1 (HYDe Park 7010).

Radiant-Heating Ltd., 475 Foleshill Road, Coventry (Coventry 88655).

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233). (*Plenum, Radiant, high and medium pressure hot water.*)

Wanson Co. Ltd., 7 Elstree Way, Borehamwood, Herts. (ELStree 5696). ("*Thermobloc*" *direct-fired air heaters.*)

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Shell-Mex and B.P. Ltd., Shell-Mex House, Strand, London, W.C.2 (TEMple Bar 1234).

HEATING TAPES (ELECTRIC)

Isopad Ltd., Barnet-by-Pass, Boreham-wood, Herts (ELStree 2817-18-19-10).

HUMIDIFIERS

Carrier Engineering Co. Ltd., Carrier House, Warwick Row, London, S.W.1 (VICtoria 6858).

Heather Filters Limited, 7 Kendall Place, Baker Street, London, W.1 (HUNter 1801). ("*Satomair*")

Howorth, James & Co. Ltd., Victoria Works, Farnworth, near Bolton, Lancashire (Farnworth 1060/1).

Spencer & Halstead Ltd., Bridge Works, Ossett, Yorkshire (Ossett 821) ("*Spenstead.*")

INCINERATORS

Bering Engineering Ltd., Doman Road, Camberley, Surrey (Camberley 4191) (5 lines).

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Heenan & Froude Ltd., Shrub Hill, Worcester (Worcester 23461) (14 lines).

McDowell, Thomas Ltd., Zone Incinerators, R.C.M. Works, South Way, Wembley, Middlesex (Wembley 5212). ("*Zone*" *smokeless incinerators.*)

Radiant-Heating Ltd., 475 Foleshill Road, Coventry, (Coventry 88655). (*gas.*)

Rider, G. F. (Process Plant) Ltd., 59-61 Tollington Park, London, N.4 (ARChway 0404).

Riley (IC) Products Ltd., 19 Woburn Place, London, W.C.1 (TERminus 2622). (*Oil burners, mechanical stokers, and incinerators.*)

Universal Machinery & Services Ltd., Viceroy Works, Low Fields Road, Leeds, 12 (Leeds 34261-3). ("*Hoskinson*" *smokeless*).

Victor Products (Wallsend) Ltd., G.P.O. Box 10, Wallsend, Northumberland (Wallsend 628331).
1327, London Road, Norbury, London, S.W.16 (POLlards 0077).
Victoria Chambers, Dale Road, Matlock, Derbyshire (Matlock 3059) ("*Victor*").

INSTRUMENTS, GAUGES, METERS, ETC.

Casella, C. F. & Co. Ltd., Regent House, Britannia Walk, London, N.1 (CLErkenwell 8581/7). (*Scientific and meteorological instruments.*)

Elliott Process Automation Ltd., Abbey Road, Park Royal, London, N.W.10 (ELGar 2111 & 7641).

U.G.I. (Meters) Ltd., 170 Rowan Road, Streatham Vale, London, S.W.16 (POLlards 2271/5). (*Air pollution meter.*)

LECTURE FILMSTRIPS AND NOTES

Wyllie, Diana Ltd., 3 Park Road, Baker Street, London, N.W.1 (PADdington 7333). (*Colour filmstrips and lecture notes on air pollution, chronic bronchitis, etc.*)

PHOTOGRAPHS

Dong, Paul, M.J.I., 20 Freshford Street, Earlsfield, London, S.W.18 (WIMbledon 9766). (*Press, industrial and exhibition photographer—official photographer for National Society for Clean Air Conference and Exhibition,* 1963 *and* 1964.)

PUMPS

Austen Pumps, Charles Ltd., Petersham Works, High Road, Byfleet, Surrey (Byfleet 43224/5). ("*Dymax.*")

RADIANT HEATING

Ekco Heating & Electrical Ltd., 41/47 Old Street, London, E.C.2 (CLErkenwell 7142).

Frost, H., & Co. Ltd., New Street (Fieldgate), Walsall, Staffs. (Walsall 25551).

James, Richard (Westminster) Ltd., Ferry Works, Lacy Road, Putney, London, S.W.15 (PUTney 7792). (*Embedded hot water floor and ceiling systems, radiant panel systems and Plasrib hot water heated acoustic ceilings.*)

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Radiant-Heating Ltd., 475 Foleshill Road, Coventry, (Coventry 88655).

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

Radiation Parkray Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

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Wilson, Henry & Co. Ltd., P.O. Box No. 6, Kirkby Industrial Estate, near Liverpool, Lancashire (Simonswood 3541) (9 lines). (*Wilson "Straightline" and "Waveline" steel panel radiators.*)

REFRIGERATION PLANT

Bass, John, Ltd., B.M.B. Crawley Works, Fleming Way, Crawley, Sussex (Crawley 28765) (9 lines).

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Lightfoot Refrigeration Co. Ltd., The, Abbeydale Road, Wembley, Middlesex (PERivale 3322).

Luwa (U.K.) Ltd., Reliance House, 340 Clapham Road, London, S.W.9 (MACauley 0333).

RESEARCH & DEVELOPMENT FACILITIES

British Non-Ferrous Metals Research Association, Euston Street, London, N.W.1 (EUSton 6411).

Head Wrightson Iron & Steel Works Engineering Ltd., Teesdale Ironworks, Thornaby-on-Tees, Yorkshire. (Stockton 62241).

ROOM HEATERS, ELECTRIC

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ROOM HEATERS, OIL

Lion Stamping Co. Ltd., 35 Marshgate Lane, Stratford, London, E.15. (MARyland 5161). ("*Leo-Fi*" *radiant oil heater.*)

ROOM HEATERS, SOLID FUEL (OPEN FIRES)

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SHEET METAL MACHINERY

Spiro Investment S.A., 14 Rue de Romont, Fribourg, Switzerland (2.70.71). (*Spiral dust machinery*).

SMOKE DENSITY METERS

Elliott Process Automation Ltd., Abbey Road, Park Royal, London, N.W.10 (ELGar 2111 & 7641).

Foster Instrument Co. Ltd., Letchworth, Hertfordshire (Letchworth 2201).

SMOKE INDICATORS

Lancashire Dynamo Electronic Products Ltd. (M.I. Group), Rugeley, Staffordshire (Rugeley 371). (*Industrial electronic control equipment.*)

Leeds & Northrup Ltd., Wharfdale Road, Tyseley, Birmingham, 11 (Acocks Green 6171/80). (*Electronic Measuring and Control Instruments.*)

Radiovisor Parent Ltd., Stanhope Works, High Path, London, S.W.19 (CHErrywood 3351).

Shandon Scientific Co. Ltd., 65 Pound Lane, London, N.W.10 (WILlesden 8671). ("*Fyrite*" CO_2 *Indicator.* "*True Spot*" *smoke tester.* "*MZF*" *draft gauge,* "*Bacharach*" *combustion testing equipment.*)

Trist, Ronald & Co. Ltd., Bath Road, Slough, Bucks. (Slough 25041). (*Electricon smoke density indicators and alarms.*)

SMOKELESS FUEL, OIL

Shell-Mex and B.P. Ltd., Shell-Mex House, Strand, London, W.C.2 (TEMple Bar 1234).

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British Coking Industry Association, 74 Grosvenor Street, London, W.1 (MAYfair 9736). ("*Sunbrite.*")

Coalite and Chemical Products Ltd., P.O. Box No. 21, Chesterfield, Derbyshire (Bolsover 2281).
103 Mount Street, London, W.1 (GROsvenor 7931). ("*Coalite*" *smokeless coal.*)

National Carbonising Co. Ltd., Thorney House, 34 Smith Square, London, S.W.1 (ABBey 7331).
Fullarton Lodge, Crowhill Drive, Mansfield, Nottinghamshire (Mansfield 2357). ("*Rexco*" *smokeless coal.*)

National Coal Board, Hobart House, Grosvenor Place, London, S.W.1 (BELgravia 2020) ("*Sunbrite*" "*Phurnacite.*")

Solid Smokeless Fuels Federation, 74 Grosvenor Street, London, W.1 (MAYfair 3327/28).

STOKERS, INDUSTRIAL

Babcock & Wilcox Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321).

Clyde Fuel Systems Ltd., Queen Elizabeth Avenue, Hillington, Glasgow, S.W.2 (Halfway 3291) (8 lines).

Crosthwaite Furnaces & Scriven Machine Tools Ltd., York Street Ironworks, Leeds, 9 (Leeds 32411-2). ("*Crosthwaite.*")

Riley (IC) Products Ltd., 19 Woburn Place, London, W.C.1 (TERminus 2622). (*Oil burners, mechanical stokers, incinerators.*)

Thompson, John (Triumph Stoker) Ltd., Triumph Works, Kirkstall Road, Leeds, 3 (Leeds 34841). ("*Triumph*" *stokers.*)

STOVES, ANTHRACITE

Pithers Radiant Stoves Ltd., 34-38 Mortimer Street, London, W.1 (MUSeum 2089 and 6573). (*Pithers Radiant stoves.*)

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London showrooms: 229 Regent Street, London, W.1 (HYDe Park 7010).

THERMOMETERS, INDICATORS, ETC.

Casella, C. F., & Co. Ltd., Regent House, Britannia Walk, London, N.1 (CLErkenwell 8581). (*Scientific and meteorological instruments.*)

THERMOSTATS

Danfoss (London) Ltd., 6 Wadsworth Road, Perivale, Middlesex (Alperton 2041).

Ekco Heating & Electrical Ltd., 41/47 Old Street, London, E.C.2 (CLErkenwell 7142).

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Morgan Air Treatments Ltd., 55/57 Salop Street, Birmingham, 12 (Victoria 2096).

WASTE FUEL BOILER PLANT

Rider, G. F. (Process Plant) Ltd., 59-61 Tollington Park, London, N.4. (ARChway 0404).

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Combustion Equipment Ltd., 61 Belsize Lane, London, N.W.3 (SWIss Cottage 4462/3). (*Cory Grit arresters, aluminium cladding for chimneys, Dribore chimneys, Mark IV furnace baffle for shell boilers, waste material disposal furnaces.*)

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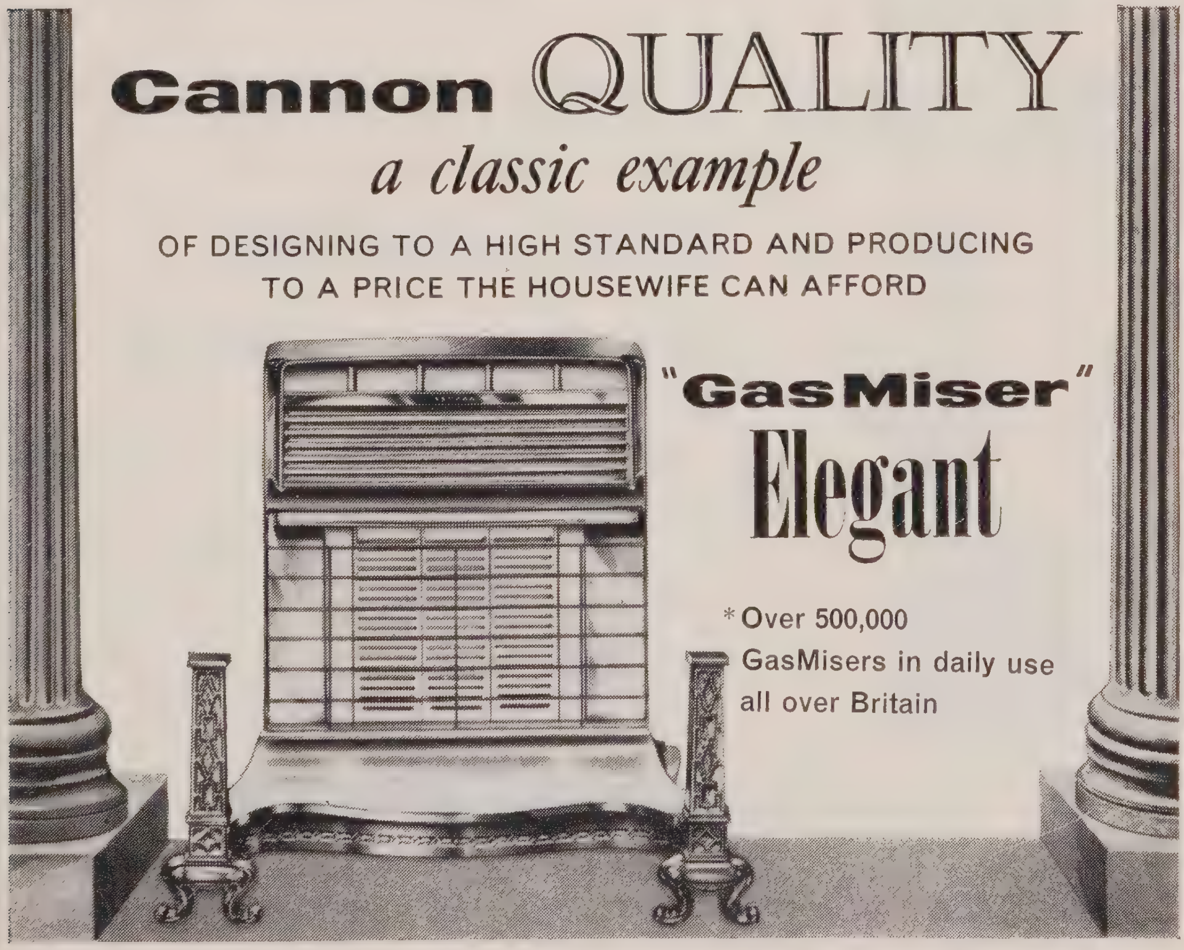
Bigwood, Joshua & Son Ltd., Wednesfield Road, Wolverhampton (Wolverhampton 24771).

Buell Ltd., 8-10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761).
Imperial Steel Works, Sheffield, 9 (Sheffield 49054).

Modern Air Systems (Leicester) Ltd., 127 Barkby Road, Leicester (Leicester 67591/2).

Rodway & Taylor (Birmingham) Ltd., 85-90 Buckingham Street, Birmingham, 19 (Central 4027/8). (*Dust, fume, ventilating and heating engineers.*)

Spencer & Halstead Ltd., Bridge Works, Ossett, Yorkshire (Ossett 821). ("*Spenstead.*")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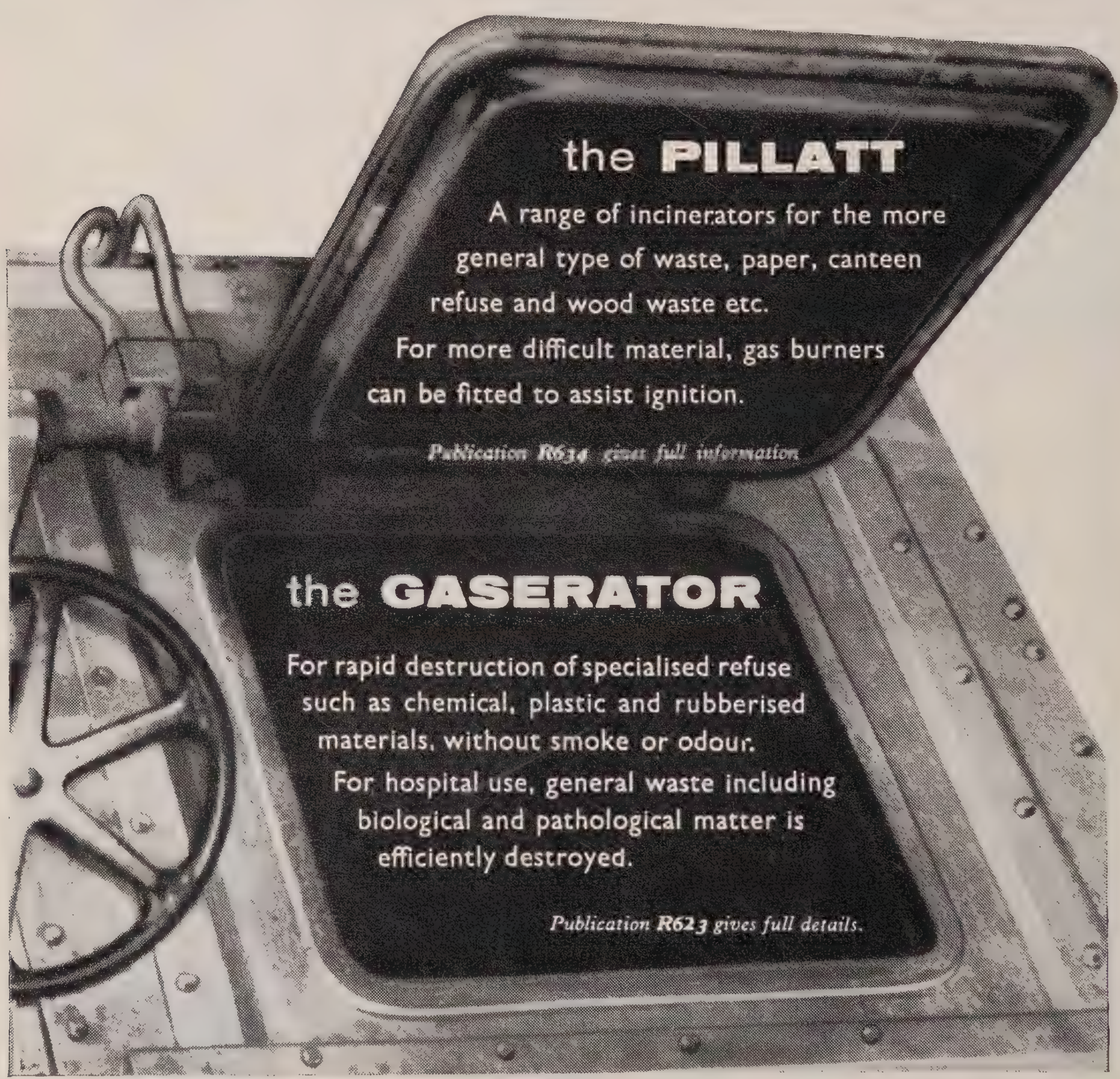

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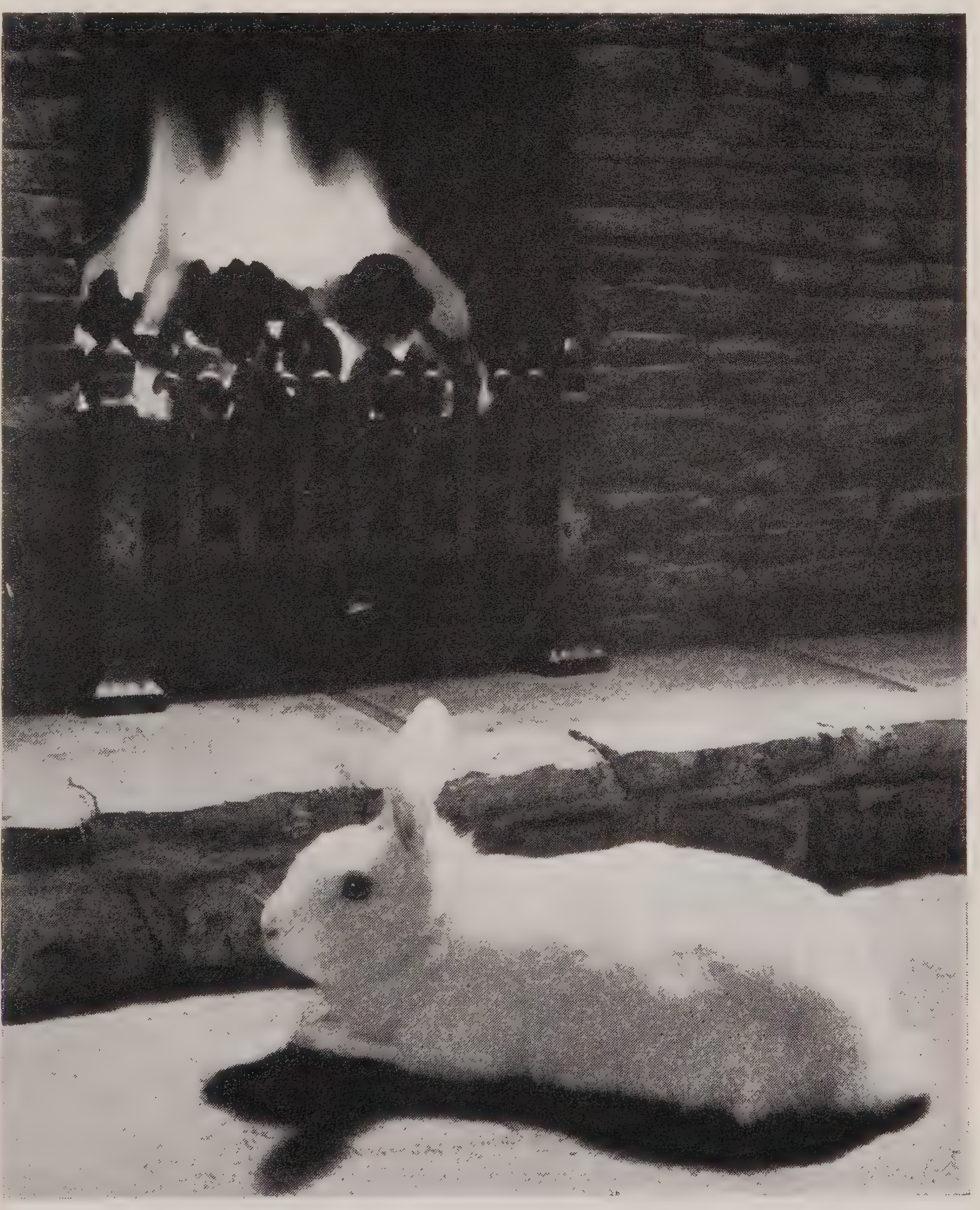

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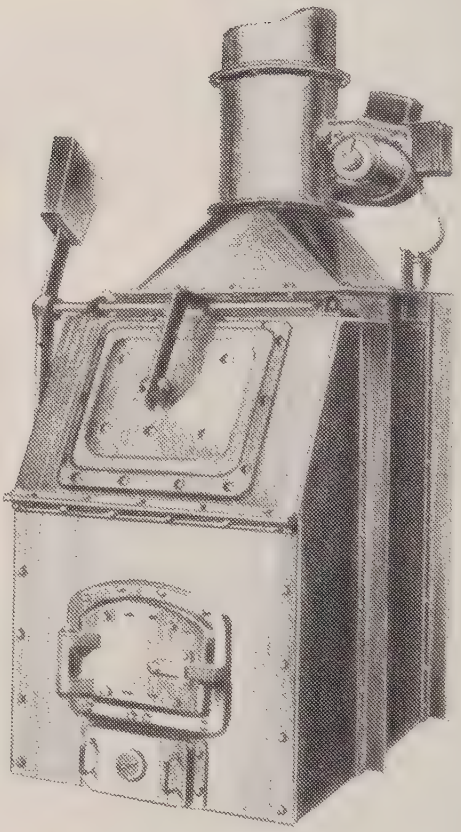

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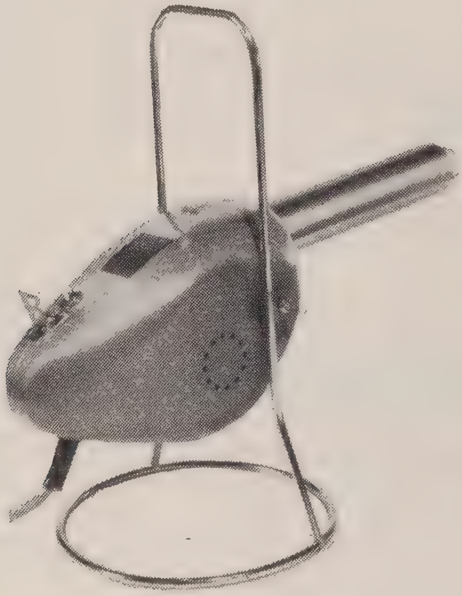

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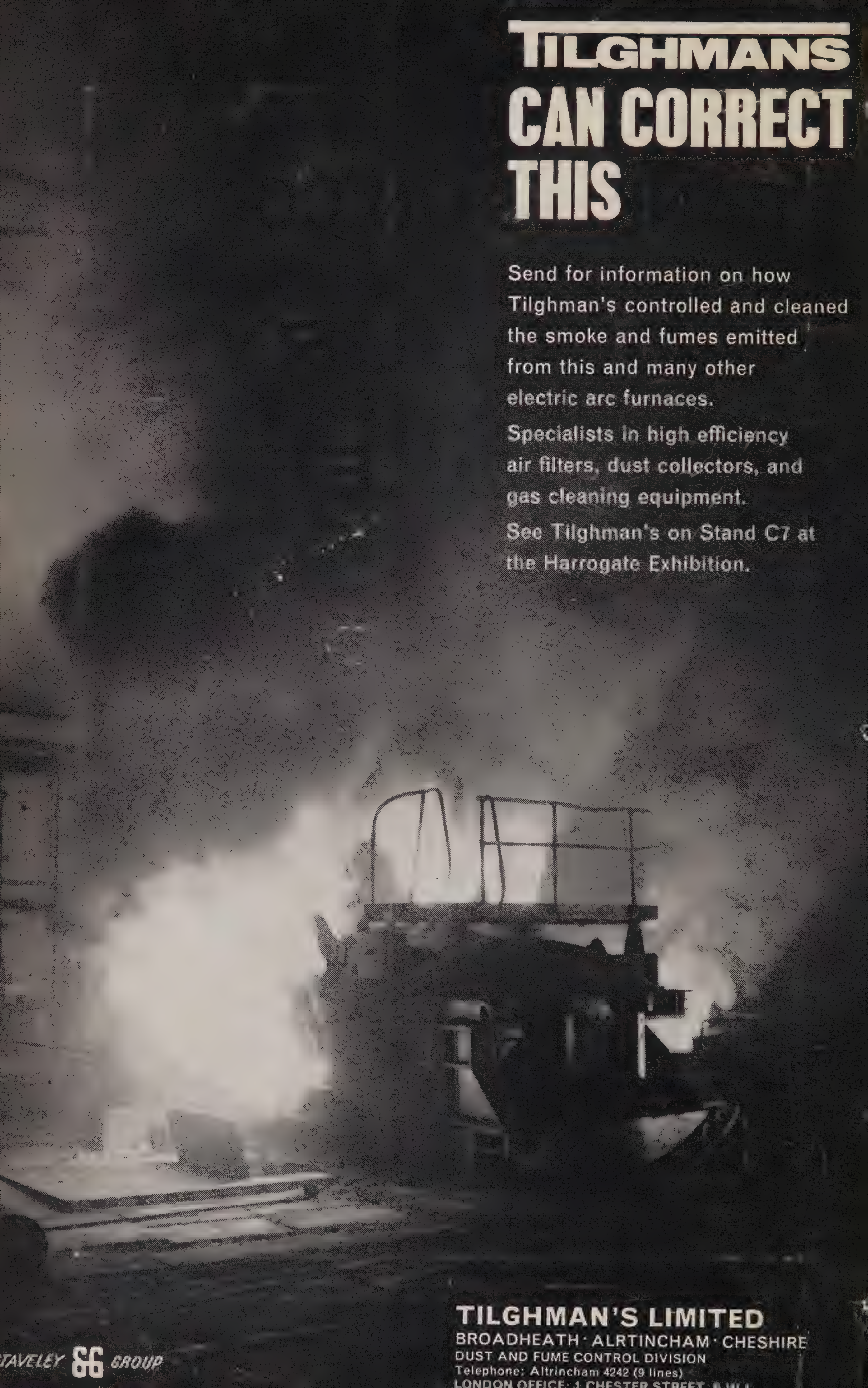

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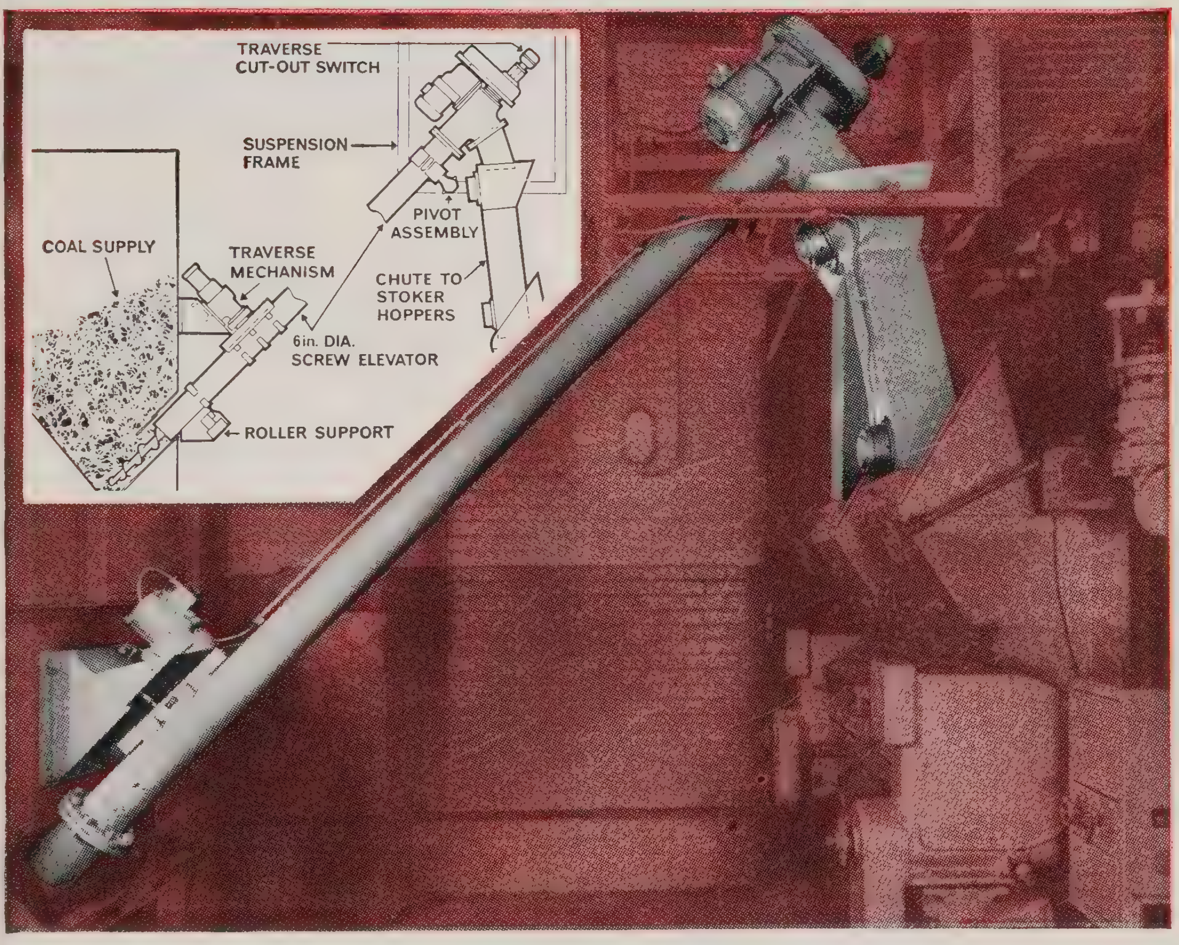

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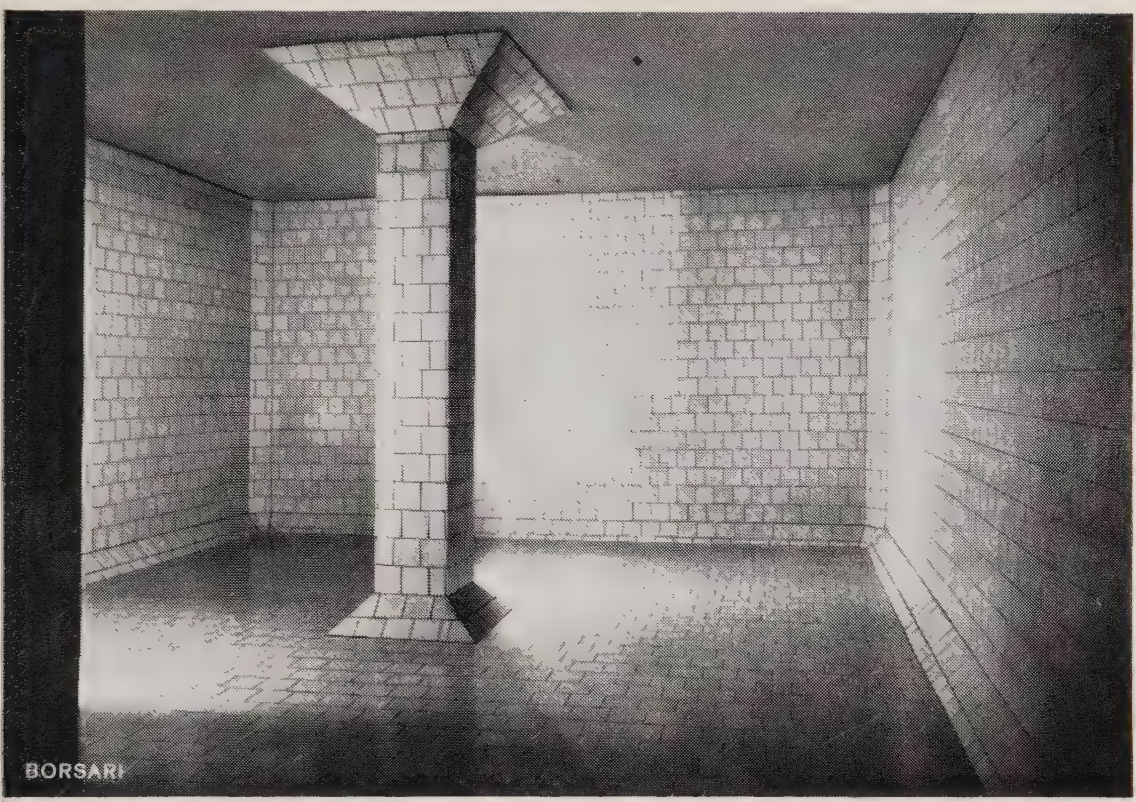

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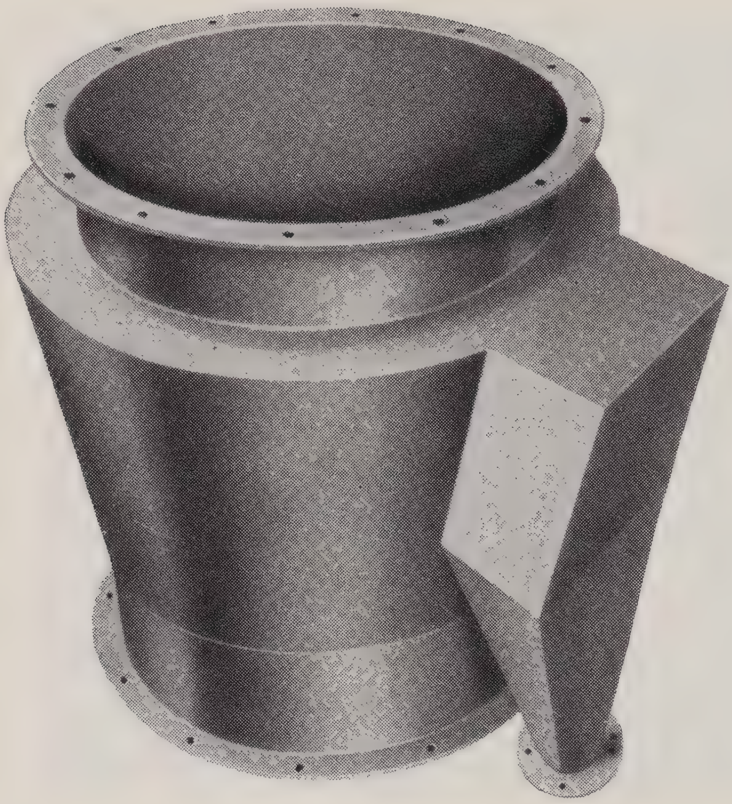

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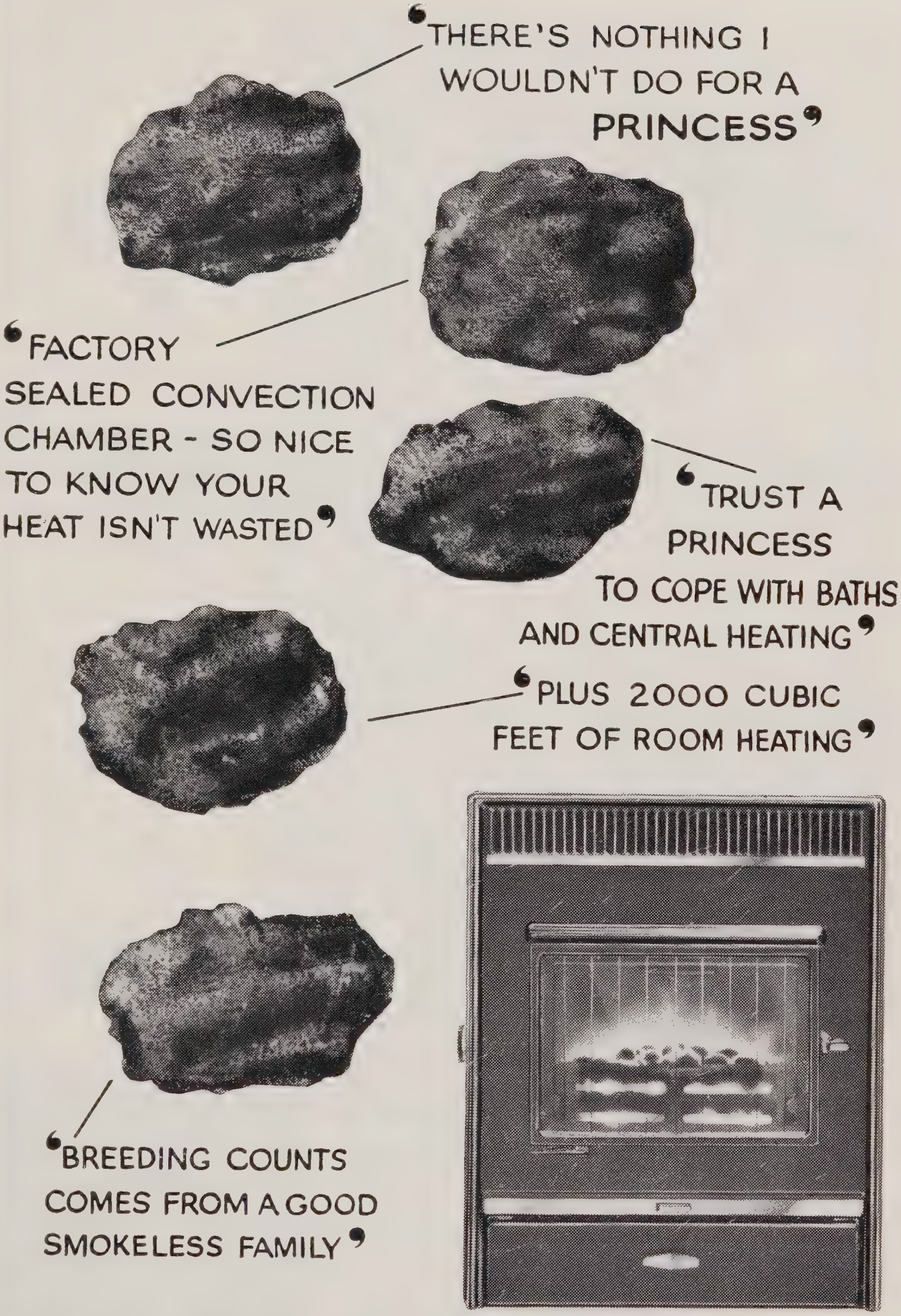
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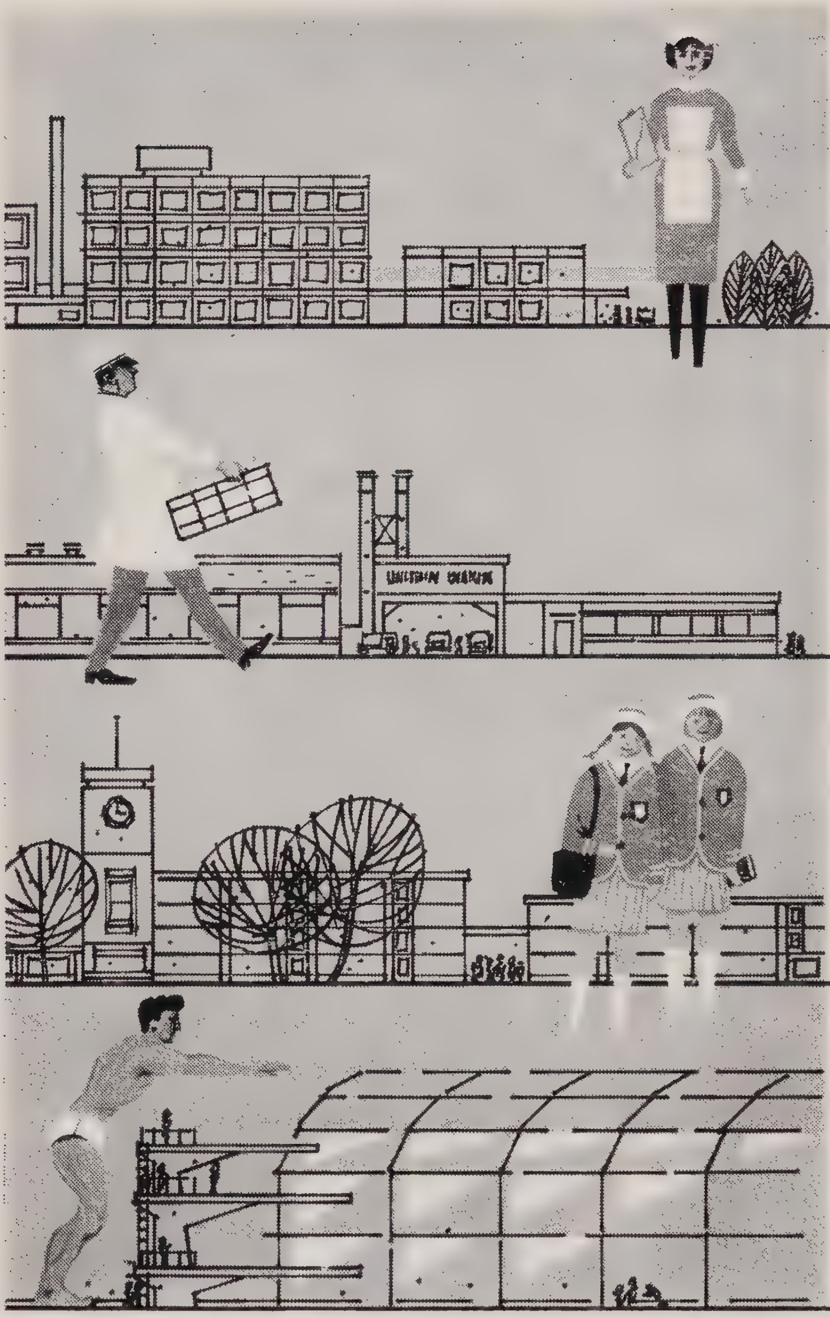

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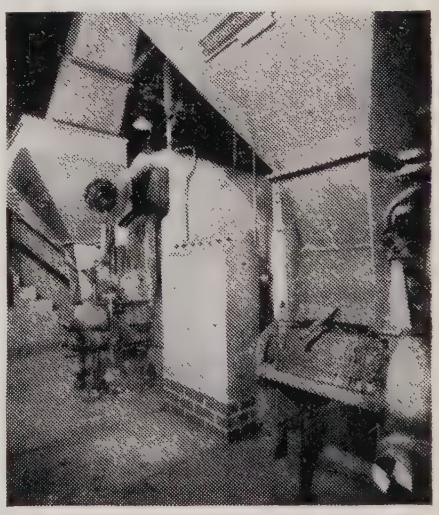

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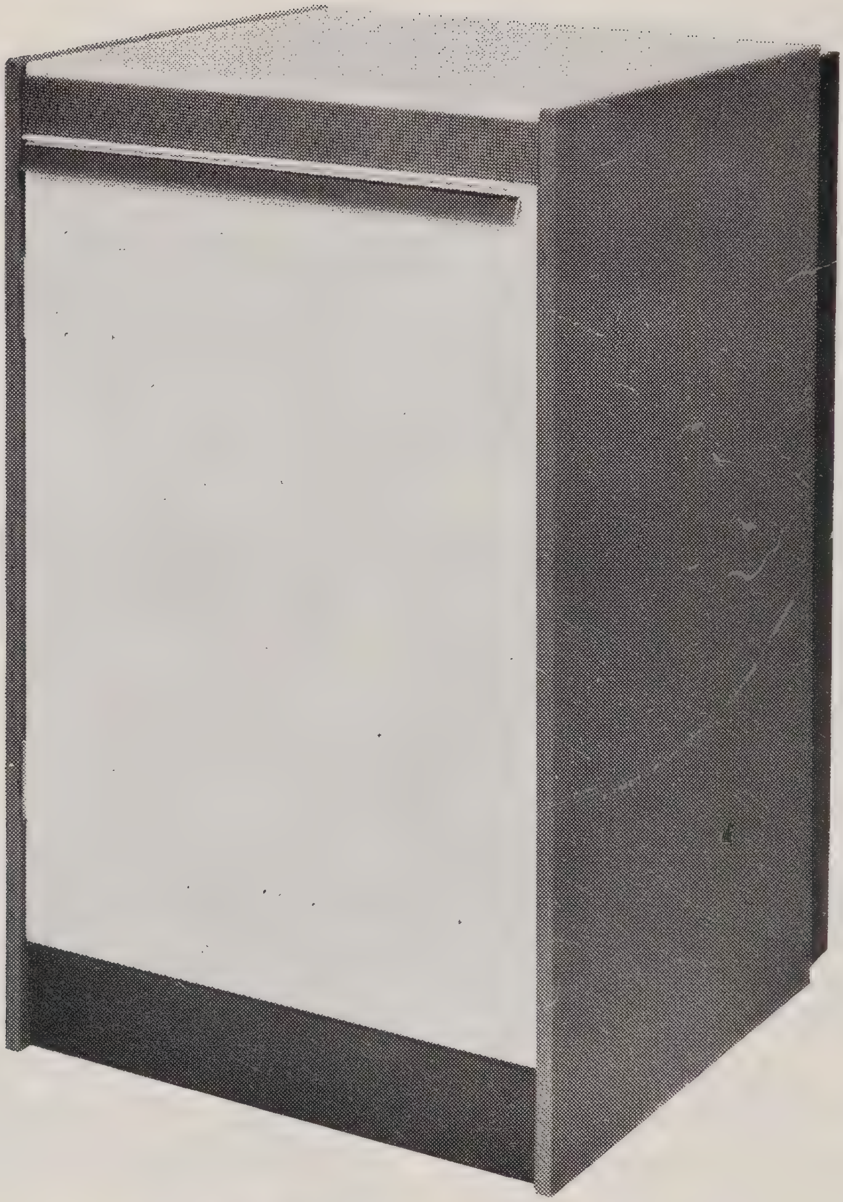

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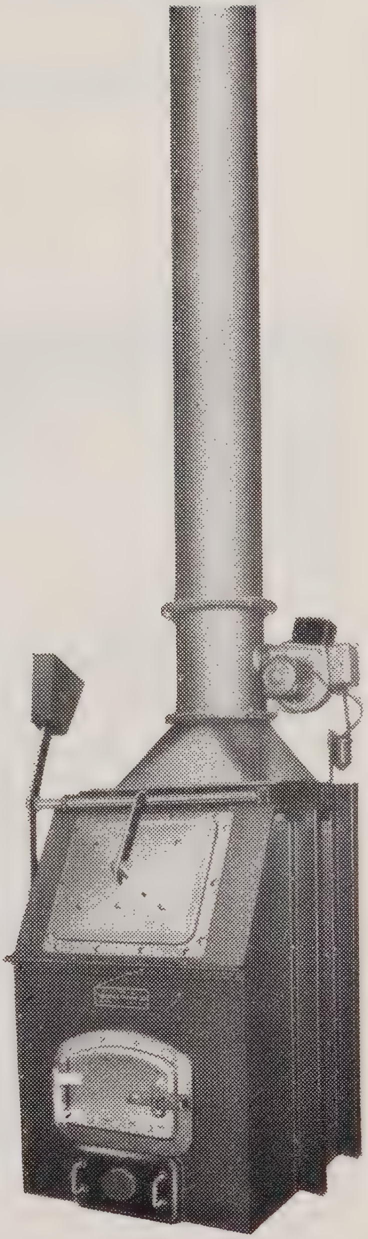

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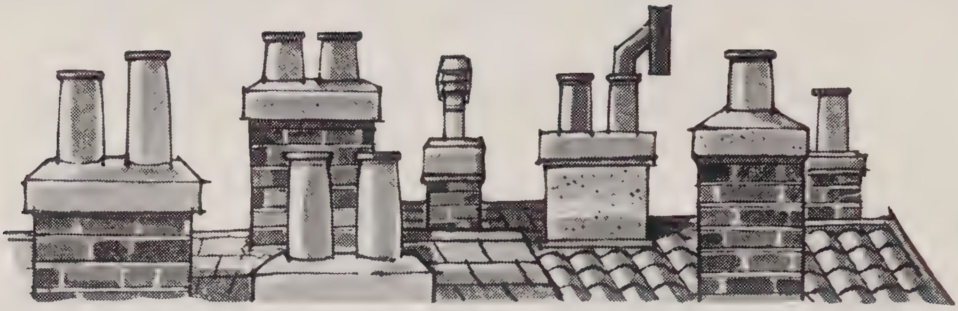

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CLEAN AIR
YEAR BOOK
1965—1966

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CLEAN AIR PROGRESS

Review for 1964–5

AS before, the following record consists mainly of brief references to events during the twelve months from May, 1964. References are made to the fuller reports given in *Smokeless Air*, the NSCA journal, numbers 130 to 133, Summer, 1964 to Spring, 1965.

The Clean Air Act

The Act has continued to make progress in the industrial field, while on the domestic side the smoke control area programme showed encouraging signs of recovering from the loss of momentum caused by changes in the fuel supply situation. The slowdown in establishing new smoke control areas proved to be not as great as was feared, and is beginning to quicken again—though by no means as rapidly as we would like. The outlook for the supply of solid smokeless fuels has improved in a number of ways since the White Paper on "Domestic Fuel Policy", and the consequent Ministry circulars were published. Further, the continuing trend for consumers in a smoke control area to elect to change to gas, electricity or oil, materially eases the solid fuel situation.

The rate of progress in setting up smoke control areas still varies very considerably from region to region. The London area continues to maintain its lead over all other regions, and is now nearing the 50 per cent mark. A table giving the latest available figures is on another page.

The Housing Act, 1964, in Section 95, amended the Clean Air Act in some important respects, of necessity confined to those applicable to housing. The changes were described in detail in a circular (46/64) from the Ministry of Housing and Local Government to local authorities.

During the year the Royal Assent was given to the Clean Air (Northern Ireland) Act, 1964. The Act is similar to the 1956 Act for England, Wales, and Scotland, but differs in having a new section on action by local authority officers in cases of road vehicles suspected of not complying with the smoke, etc., regulations of the Road Traffic (N.I.) Act; and also by giving powers for further action to be taken in respect of gaseous emissions, by means of regulations to be made when "the Ministry is satisfied that practicable means exist for reducing or controlling" them.

An occasion of note was the publication during the year of the 100th annual report of the Alkali Inspectors. This was followed by a Des Vœux Memorial Lecture at the Harrogate Conference of the NSCA on "A Century of Achievement", by Dr. J. S. Carter, then Chief Alkali Inspector for England and Wales, but now retired.

The International Scene

International activities, and progress in other countries, were numerous and important during the year. An important Federal Act, known shortly as the Clean Air Act, was passed in the United States. It is primarily an Act to promote clean air through research and education and by its powers to give assistance and encouragement, including financial help, to state and city activities in the study of the problem and the implementation of their own legislation.

A new Clean Air Act was also passed by the New South Wales Government. This is more akin to our own Alkali Works Act and Regulations. A new air pollution law was passed also in Belgium, but is not yet in operation.

The most important meeting during the year was the Air Pollution Conerence at Strasbourg convened by the Council of Europe. Fourteen countries participated, with 377 representatives ppointed by their governments attending, together with a considerable number of observers. A series of ecommendations for further action was made and is now being studied by a special committee for the Council of Ministers.

Also noteworthy during the year was a small conference in Washington which considered and submitted proposals for the establishment of an International Union of Air Pollution Prevention Associations. The proposals for a constitution for such a Union have now been approved by the participating organizations. The Union is confined to non-governmental associations, and the six founder members are the clean air bodies in Argentina, France, W. Germany, Japan, the United Kingdom and the United States. Further details of the six associations are given on a later page.

A further event of importance was the Clean Air Congress and Exhibition, held at Dusseldorf, W. Germany, in April, 1965. This has been fully reported, and abstracts of papers printed, in *Smokeless Air*.

THE LAW RELATING TO AIR POLLUTION

The principal legislation in Great Britain (excluding Northern Ireland) is the Clean Air Act, 1956. This supersedes the Public Health (Smoke Abatement) Act, 1926, which in its turn amended the smoke abatement section of the Public Health Act, 1875. References to earlier legislation are given in the chronological history of air pollution on another page.

Several amendments to the domestic (smoke control area) provisions of the Clean Air Act were included in the Housing Act, 1964. A note on these changes is given below.

A Clean Air (Northern Ireland) Act received the Royal Assent in 1964. Its provisions are largely identical with the 1956 Act.

Fumes and gases from industrial processes are controlled through the Alkali &c., Works Act, 1906, administered by the Alkali Inspectorate. Under the Clean Air Act smoke, dust and grit emission from certain scheduled processes are also the responsibility of the Inspectorate. (See the section, following, on the Alkali Act.)

Apart from the Clean Air Act it should be noted that action may be taken with regard to smoke or other nuisance from air pollution under common law procedure, and this can be used to secure both damages and an injunction.

In addition to a number of older Local Acts containing smoke abatement provisions, over 50 local authorities obtained powers, between 1946 and 1956, for the establishment of smokeless zones and/or the optional prior approval of new industrial fuel-burning installations. Local authorities may continue to use these provisions unless the relevant sections of their Acts should be repealed, as may be done under section 35 of the Clean Air Act. A number of local authorities have also established smokeless housing estates, where smokelessness is ensured not by legislation but by conditions of tenancy.

Pollution from road vehicles is not controlled under any of the clean air legislation, but through the Road Traffic Act and Regulations, a description of which is given on a following page.

The Clean Air Act in Outline

For a fuller digest of the contents of the Act reference may be made to the *Summary of the Clean Air Act*, published by the Society. The following outline necessarily omits much detail of importance.

SS.1 and 2 deal with **Dark Smoke,** defined as shade No. 2 of the Ringelmann scale. Regulations have been issued on the extent to which dark smoke is permitted. It is an offence to emit dark smoke beyond these limits, and the only defences that may be used are specified: lighting up from a cold furnace; unavoidable failure of plant; unavoidable use of unsuitable fuel; and a combination of any of these. For seven years (from 5th July, 1956) there was a further defence that it was not possible to complete necessary alterations to plant.

(Stat. Inst. 1958. No. 498). (Scotland: Stat. Inst. 1958. No. 1933 (S.106)).

S.3 requires all **New Furnaces,** other than domestic (i.e. less than 55,000 B.Th.U. per hour) to be as smokeless as practicable. Local authorities *must* be notified of new installations and *may* be asked to give prior approval.

S.4 relates to regulations for the installation of **Smoke Density Recorders,** etc.

SS.5 to 9 require all furnaces to use means to minimize **Grit and Dust from Furnaces:** large *new* furnaces (burning more than 1 ton per hour) and all new pulverized fuel furnaces of any size to secure prior approval of grit arresting equipment to be installed; regulations for measuring and recording grit and dust; supplying local authorities with information about such records; and putting outdoor furnaces on the same footing as those in buildings.

S.10, **Height of Chimneys,** gives powers to local authorities to reject plans for new buildings if chimneys are not sufficiently high.

SS.11 to 15 concern **Smoke Control Areas,** which may be established by local authorities under an Order requiring Ministerial approval. Smoke control areas may be entirely smokeless (as with smokeless zones) or may make certain exemptions or impose special conditions. For domestic (and charitable, etc.) premises local authorities may make a grant towards the cost of converting grates, etc., to appliances suitable for smokeless use. The authority may recover part of the grant from the central Exchequer, and normally the cost of conversion will be owner or occupier and local authority 30 per cent each, Exchequer, 40 per cent.

In a case of smoke emission in a control area it is a defence if an authorized fuel only was being burned. Regulations defining authorized fuels have been issued.

(Stat. Inst. 1956, No. 2023).

(The Housing Act, 1964, S.95, amends certain provisions of the above sections).

S.16 deals with **Smoke Nuisances** from smoke other than dark smoke. In this case it is an offence only when a nuisance to inhabitants of the neighbourhood has been proved.

S.17 concerns *processes* that are scheduled as **Special Cases** by Ministerial regulation, and in which the control of pollution will be by the Alkali Inspectorate and not the local authorities. The processes include those that are or will be registered under the Alkali Act. With respect to smoke, grit and dust the Minister may transfer control of particular *premises,* or part of them, to a local authority.

(Stat. Inst. 1958, No. 497). (Scotland: Stat. Inst. 1958, No. 1932 (S.105).)

S.18 on **Colliery Spoilbanks,** requires the owner of a coal or shale mine or quarry to use all practicable means to prevent the combustion of deposited refuse, and to minimize any smoke or fumes that may occur.

S.19 is to the effect that **Railway Engines** are subject to dark smoke emission control as if they were buildings. The owner of the engine must also use any practicable means there may be to minimize smoke emission.

S.20 is to the effect that dark smoke from **Vessels** in specified waters shall be controlled as such smoke from buildings. This applies to vessels in any water not navigable to a sea-going ship and in other defined waters.

(Stat. Inst. 1958, No. 878). (Scotland: Stat. Inst. 1958, No. 1934 (S.107).)

S.21 gives a local authority power of **Exemption** from action under the Act, for a stated period, for research or investigations relevant to the problem of air pollution.

S.22 requires a local authority to report smoke emissions from **Crown Premises** to the Minister responsible for the premises. He must then inquire into the case and if there is cause for complaint must use all practicable means to prevent or minimize the emission or abate the nuisance.

S.23 provides for the setting up of a **Clear Air Council,** with the Minister of Housing, Local Government and Welsh Affairs as its Chairman, to review progress and obtain advice on air pollution matters. There is also a similar Clean Air Council for Scotland.

(Stat. Inst. 1957, No. 766).

S.24 states that **Building Byelaws** "may require the provision in new buildings of such arrangements for heating or cooking as are calculated to prevent as far as practicable the emission of smoke." (A model byelaw for this purpose has now been issued but is being revised to meet the provisions of the Housing Act, 1964).

S.25 gives local authorities power to undertake or contribute towards the cost of **Research and Publicity,** etc.

S.26 relates to the improper **Disclosure of Information** obtained as a result of administering the Act.

S.27. **Penalties.** In summary, and in each case quoting the maximum penalty: *Dark Smoke,* private dwellings, £10; other cases, £100 for each offence (e.g. each day). *New furnaces not smokeless:* £10. *Smoke emission in control areas:* £10 for each offence. *Disclosure of Information:* £100 or 3 months imprisonment, or both. *Other offences:* £100.

S.28 relates to **Authorization of Works.**

S.29 on **Enforcement,** refers to the powers of local authorities.

S.30 on **Notification of Offences** is procedural.

SS.31, 32 and 33 deal with administrative and legal matters.

S.34 on **Interpretation,** gives the meaning to be applied to a number of words and phrases used in the Act.

S.35 deals with **Repeals and Transitions.**

S.36 excludes **Northern Ireland** from the provisions of the Act.

S.37 gives the **Short Title** and commencement of the Act.

The First Schedule relates to the confirmation and coming into operation of orders of local authorities under section 11.

The Second Schedule consists of amendments to the Alkali &c., Works Regulation Act, 1906.

The Third Schedule gives modifications of, and provisions supplementary to, Public Health Acts, etc.

The Fourth Schedule lists the enactments repealed by the new Act.

Clean Air Act Regulations

Authorized Fuels

The Smoke Control Areas (Authorized Fuels) Regulations came into force on 31st December, 1956. These relate to section II of the Clean Air Act, which provides for a defence in the case of smoke emission from a building in a smoke control area if it is proved that the smoke "was not caused by the use of any fuel other than an authorized fuel." The fuels authorized in the regulations are: anthracite, briquetted fuels carbonized in the process of manufacture, coke, electricity, gas, low temperature carbonization fuels and low volatile steam coals.

Liquid Fuels

The Model Building Byelaw described above does not include appliances for the use of liquid fuels, nor do the Authorized Fuel Regulations include liquid fuel as an authorized fuel. The Smoke Control Areas (Exempted Fireplaces) Order, 1957, exempts from control under section 11 of the Clean Air Act fireplaces designed or adapted for the combustion of liquid fuel, " provided they are so installed, maintained and operated as to minimize the emission of smoke." Under section II the Minister may make Orders exempting from control in smoke control areas any fireplace that he is satisfied can be used without producing any substantial quantity of smoke when burning other than an authorized fuel. The Order therefore allows for the use of oil-burning appliances in smoke control areas, and also has the effect of allowing such appliances to be included among those permitted under the Model Building Byelaws.

It should be noted that although the use of oil is thus permitted in smoke control areas and under the Building Byelaw, oil remains a non-authorized fuel, so that in case of smoke emission from an oil-burning installation in a smoke control area the authorized fuel defence could not be used.

Mechanical Stokers

The Smoke Control Areas (Exempted Fireplaces) Order, 1959, exempts mechanical stokers from smoke control area orders in the following terms: "Fireplaces, other than fireplaces fired by pulverized fuel, constructed on or after the 31st day of December, 1956, and equipped with mechanical stokers, or adapted on or after that date for use with such stokers," on condition that "the fireplace shall be so installed, maintained and operated as to minimize the emission of smoke. No fuel shall be used other than that for which the mechanical stoker was designed."

Appliances

The Exempted Fireplaces Order, 1959, also exempts two specified appliances: the Solid Fuel Ductair Unit, manufactured by Radiation Ltd., and the Fulgora Slow Combustion Stove, manufactured by Fulgora Stoves, Ltd., on condition that they "shall be so installed, maintained and operated as to minimize the emission of smoke, and in any case in accordance with the manufacturers' instructions." In the case of the Fulgora Stove it is also a condition that "no fuel shall be used other than wood waste in clean condition."

Building Byelaw

Equipment of New Buildings

A Model Byelaw, to meet the provisions of section 24 of the Clean Air Act has been issued by the Ministry of Housing and Local Government. This provides for new buildings to be equipped with such appliances only as are suitably designed to burn gas, electricity, gas coke or anthracite. It does not apply to larger appliances, of a capacity of 55,000B.Th.U. or more per hour, which are controlled by section 3 of the Act. The byelaw does not require smokeless fuels to be used, but ensures that suitable appliances are installed in new buildings which later may be included in a smoke control area. An appliance suitable for gas coke or anthracite will also be suitable for the more reactive cokes and semi-cokes.

The Byelaw is at present being revised to meet the requirements of S.95 of the Housing Act, 1964.

Firelighting by Sticks and Paper

Circular 28/60 of the Ministry of

ousing and Local Government states at while gas remains the best and ost convenient means of lighting olid smokeless fuels in smoke control reas, there will be houses which cannot e supplied with gas at a reasonable ost and also some people may object o having gas at all. For the present, herefore, the Minister accepts that the mall amount of smoke caused in this ay must be accepted in the general nterest of making progress with the reation of smoke control areas.

" The Minister thinks that legal over for the use of sticks and paper or lighting fires can best be given by he use in smoke control orders of the ower of exemption in section 11(3) of he Clean Air Act, 1956. Local autho- ities could give an exemption in eneral terms extending to fireplaces in ny building or separately occupied arts of a building which is not upplied with town gas; or alternatively, hey could give a specific exemption to amed individual premises. Either ype of exemption should be subject to condition to secure that it would have ffect only where authorized fuels or indling sticks and paper were being used ".

The Minister asks that such exemption should be included where it is apparent that some buildings or parts of buildings will remain without a gas supply. He also asks that if a local authority should decide not to include an exemption along these lines in such a case, then they should give an explanation when submitting the order for confirmation.

The circular contains a model for a general exemption and also a note on, and includes as appendix II, a document entitled " Smoke Control Areas: Your Questions Answered ". This is not available direct to the public but is published as a guide for local authorities who may wish to produce explanatory booklets for householders in proposed smoke control areas.

Dark Smoke Regulations

In Statutory Instrument 1958, No. 498, " The Dark Smoke (Permitted Periods) Regulations, 1958," the Minister of Housing and Local Government has made the regulations required for the operation of Section 1 (2) of the Clean Air Act. The Regulations permit the following:

(i) Not more than 10 minutes dark smoke emission in the aggregate from any chimney in any period of 8 hours.

(ii) This permitted time extended to 14 minutes if soot blowing is carried out within the 8 hour period.

(iii) The 10 and 14 minutes to be extended for chimneys serving more than one furnace as follows:
A chimney serving 2 furnaces, 18 and 25 minutes respectively; a chimney serving 3 furnaces, 24 and 34 minutes respectively; a chimney serving 4 or more furnaces, 29 and 41 minutes respectively.

(iv) A continuous emission of dark smoke from the chimneys of factories (other than that caused by sootblowing) for a period not exceeding 4 minutes.

(v) The emission of black smoke up to 2 minutes in the aggregate in any period of 30 minutes.

The regulations apply to dark smoke from the chimneys of factories, shops, offices and railway engines, but not to dark smoke from the funnels of ships, for which separate regulations have been made, as set out below.

Dark Smoke (Permitted Periods) (Vessels) Regulations

These regulations, under s.1(2) of the Clean Air Act, are contained in Statutory Instrument 1958, No. 878. They specify the periods within which dark smoke is permitted from vessels in various classes of case, as detailed in the schedule below. The phrases in italics, "10 minutes in 2 hours", etc., mean that 10 minutes emission of dark smoke *in the aggregate* is permitted in any period of 2 hours.

Schedule—Classes of Case

1. Emissions from a forced draught oil-fired boiler furnace, or an oil engine. 10 *minutes in* 2 *hours.*
2. Emissions from a natural draught oil-fired boiler furnace (except in the cases falling within class 4 below). 10 *minutes in* 1 *hour.*
3. Emissions from a coal-fired boiler furnace:
   (*a*) when the vessel is not under way (except in the cases falling within class 4 below). 10 *minutes in* 1 *hour.*
   (*b*) when the vessel is under way. 20 *minutes in* 1 *hour.*
4. Emissions from a natural draught oil-fired boiler furnace or a coal-fired boiler furnace in the following cases:
   (*a*) a vessel with funnels shortened for the purpose of navigating the Manchester Ship Canal;
   (*b*) a tug not under way, but preparing to get under way or supplying power to other vessels or to shore installations;
   (*c*) a vessel not under way but using main power for the purpose of dredging, lifting, pumping or performing some other special operation for which the vessel is designed. 20 *minutes in* 1 *hour.*
5. Emissions from any other source. 5 *minutes in* 1 *hour.*

In addition, *continuous* dark smoke caused otherwise than by the soot-blowing of a water-tube boiler, shall not exceed:

(1) in the case of classes 1 and 2 above, 4 *minutes.*

(2) in the case of natural draught oil-fired boiler furnaces in class 4, 10 *minutes.*

Further, in *no case* shall black smoke (Ringelmann 4) be emitted for more than 3 *minutes* in the aggregate in any period of 30 *minutes.*

The Alkali, etc., Works Regulation Act

The Alkali, etc., Works Regulation Act, 1906, consolidates and extends previous similar Acts, the first of which was passed in 1863.

The Act includes a schedule of chemical processes and a list of noxious or offensive gases. Since 1906, this schedule and list have been extended by Statutory Orders made under the Public Health (Smoke Abatement) Act, 1926 and the Alkali, etc., Works Regulation (Scotland) Act, 1951. Such orders were made in 1928, 1935, 1939 and 1950. The essence of the Act lies in the requirements that (1) scheduled processes must be registered annually, (2) as a prior condition in the case of a first registration the scheduled process must be provided to the satisfaction of the Chief Inspector with the " best practicable means " for preventing the escape of noxious or offensive gases to the atmosphere and for rendering such gases harmless and inoffensive, (3) the " best practicable means " must thereafter be maintained in good and efficient working order and must be operated continuously, (4) in the case of certain processes, upper limits are specified for the concentration of total acidity in effluent gases which may be discharged to the atmosphere.

Provision is made for the setting up and maintenance of an inspectorate to administer the Act, and regulations are included relating to the registration and inspection of works, general procedure, penalties, etc. The Chief Inspectors are required to make an Annual Report to be laid before Parliament, relating to the work of the inspectorate.

Under the Clean Air Act, 1956, the provisions of the Alkali Act are extended to apply to smoke, dust and grit from premises controlled under the ct as they already do to noxious or ffensive gases. Thus from 31st ecember, 1956 virtually all forms of ir pollution from processes registered nder the Alkali Act will be subject to ontrol under that Act by the Alkali nspectorate. Any other parts of a ork are the responsibility of the local uthority.

he Alkali, etc., Works Orders, 1958, 1961, *and* 1963

The Minister of Housing and Local overnment extended the Alkali Act y an Order which came into operaion on 1st June, 1958. This Order dded to the list of processes scheduled nder the Act a number which are esponsible principally for smoke, grit nd dust. Among these processes are number for the production of iron nd steel, iron or steel melting proesses, and some copper and aluminium rocesses. Gas and coke works, lectricity works, coal fired producer gas plant and lime kilns and certain ceramic kilns fired by coal or oil were also added to the list together with sulphate reduction and caustic soda plant and certain types of chemical incinerators. The Order also made the appropriate additions to the list of noxious or offensive gases.

The 1961 Order deals with emissions from the processing of uranium, beryllium, selenium and their compounds. The 1963 Order is much more comprehensive and was prepared largely to take into account the major changes which have taken place in recent years in the heavy chemical and allied industries. It also covers the burning of scrap cable to remove the insulation. This is necessary because of the increasing amount of cable covered with polyvinyl-chloride, which gives rise to phosgene on burning. The Order begins the policy of de-scheduling certain of the 1958 Order Smoke processes.

Road Traffic Pollution Law

The Statutory Regulations governing he emission of smoke or other forms of ollution from road vehicles are made by he Minister of Transport and Civil Aviation in exercise of the powers conerred on him by sections 3, 17, 30, and 111 of the Road Traffic Act, 1930 (20 & 21 Geo.5.c.43.).

The Regulations at present operative came into force on 1 November, 1963 and are known as "The Motor Vehicles (Construction and Use) Regulations 1963. (Statutory Instruments 1963, No. 1646)." Under Part IIA. of the Regulations, governing the construction, weight and equipment of vehicles, Regulation 22 (Emission of smoke or vapour), states: "Every motor vehicle shall be so constructed that no avoidable smoke or visible vapour is emitted therefrom."

Regulation 23(1) includes compression ignition (i.e., diesel) engines in the words "motor vehicles", and (2) requires excess fuel devices to be so fitted that they cannot be operated by a person while he is being carried by the vehicle, unless (a) such a device cannot be used after the engine has been started, or (b) does not cause any increase in smoke or visible vapour.

Part III of the Regulations governs the Use of Vehicles. Regulation 80 states:

"No person shall use or cause or permit to be used on a road any motor vehicle from which any smoke, visible vapour, grit, sparks, ashes, cinders, or oily substance is emitted if the emission thereof causes or is likely to cause damage to any property of injury to any person who is actually at the time or who reasonably may be expected on the road, or is likely to cause danger to any such person as aforesaid".

Regulation 81 relates to the use of the excess fuel device, and requires such a device to be so maintained that it does not cause the engine to be supplied with excess fuel while the vehicle is in motion on a road; nor allows any person so to use it.

(The operation of the regulations, by Ministry of Transport officers, and by the Police, is discussed, together with the technical factors involved, in a paper by H. D. Fawell, Ministry of Transport, published in the NSCA Harrogate Conference, 1964, *Proceedings.)*

Warren Spring

The Work of the Warren Spring Laboratory of the Ministry of Technology on the Investigation of Air Pollution and its Abatement

Warren Spring Laboratory carries out research on the nature and extent of air pollution, and on its prevention and abatement, in order to provide technical information necessary for the administration of clean air legislation, for town planning and the location of industry, and for research into the effects of air pollution.

The National Survey of Air Pollution

The National Survey, devised by Warren Spring Laboratory, is planned statistically to enable valid conclusions to be drawn on the incidence of air pollution in urban areas throughout the country, while restricting observations to a reasonably small number of sites. Some 120 towns were chosen for the purpose and each agreed to make daily measurements of smoke and sulphur dioxide in the following five types of district, in so far as examples are to be found in each town:

(*a*) Residential area with a high population density, such as old terrace housing.
(*b*) Residential area with a low population density, such as a housing estate or suburb.
(*c*) Industrial area.
(*d*) Commercial area, with central heating predominating.
(*e*) Smoke control area, which may be any of the above types.

Observations are also being made at a number of sites in the depth of the country to give background information. All sites for the survey were chosen by the local authority in collaboration with Warren Spring Laboratory, and on 1 April, 1965, after the formation of the Greater London Council, observations for this statistically-planned part of the Survey were being made by 120 authorities operating 409 instruments and a further 33 authorities in the area administered by the Greater London Council operating 215 instruments.

In addition, a further total of 244 local authorities and others were making daily observations of smoke and sulphur dioxide at 427 sites. These measurements are being made on the initiative of the authorities concerned, and primarily for their own local purposes, but they form a second part of the National Survey and comparison of these results with the national averages established by the first part of the survey will be of great value.

Under part three of the Survey a further 50 sites were operated by 37 authorities in rural areas, to provide data on drift of pollution and background information.

Other Measurements of Air Pollution

In addition to the daily smoke and sulphur dioxide observations, many local authorities and other bodies make monthly measurements of grit-and-dust-fall, using the British Standard Deposit Gauge, and of the rate of reaction of sulphur compounds with lead dioxide. Warren Spring Laboratory continues to give advice and help in connection with such measurements.

Standing Conference of Co-operating Bodies

All local authorities and other organizations who make measurements of air pollution, either as part of the National Survey or purely for their own local purposes, and who submit the data regularly to Warren Spring Laboratory for publication, are entitled to send representatives to the Standing Conference of Co-operating Bodies, which meets twice yearly to discuss matters of interest connected with air pollution. Other bodies may do so on payment of a subscription. At 31 March, 1965, 443 bodies had appointed representatives to the Conference.

Publication of Results

All data submitted to the Laboratory are collated, and summaries are published in a Monthly Bulletin, one section of which deals with daily measurements of smoke and sulphur dioxide, and another with monthly measurements made with the deposit gauge and the lead dioxide instrument. A third section of the Bulletin contains abstracts of papers and other information on air pollution that have appeared in the period concerned. Annual Summaries of the data are also published.

These Bulletins and Annual Summaries are available on request to all concerned with problems of air pollution.

In addition, a series of Reports on the Investigation of Atmospheric Pollution published by H.M. Stationery Office, gives analyses of these results and an account of research on the measurement and abatement of air pollution.

Instruments

Work by the Laboratory on the calibration of the daily smoke filter and on the accuracy of the daily hydrogen peroxide method for sulphur dioxide has now led to British Standard Specifications on both methods and to their acceptance internationally by the Organization for Economic Co-operation and Development (OECD). Effort is now concentrated on the development of a reasonably cheap automatic SO_2-recorder.

Town Planning Studies

In the past few years it has become increasingly apparent that while it is quite impracticable to control the amounts of sulphur oxides in the air by limiting their emission (as is done for smoke under the Clean Air Act) it is, nevertheless, possible to make great improvements by taking full advantage of natural dispersion processes. This can be done by the proper design of chimneys in relation to buildings and the proper siting of the various types of residential district in relation to each other and to industrial installations. A great deal of effort is being devoted to obtaining sufficient knowledge of the distribution and spread of pollution in urban areas to enable town planners to do their work satisfactorily from an air pollution point of view.

An intensive investigation is in progress on the effect of the turbulence in the wake of tower blocks of offices or flats on the pollution in the neighbourhood. Another concerns the spacing of such blocks from each other and from separate large industrial emitters. A third has to do with the design of the chimney on the tower block itself.

The more general problem of the design of chimneys in relation to buildings, to avoid flue gases being entrained in the turbulent wake, is being studied by means of a furnace and chimney that can be erected at various positions in relation to the large laboratory block at Warren Spring Laboratory. Parallel tests are being carried out by the National Physical Laboratory on corresponding models in a wind tunnel. This investigation has been undertaken at the request of the Federation of British Industries.

The spread of pollution in a town from a single emitter is being investigated at Cambridge using tracers emitted from a low chimney.

While the National Survey provides a great deal of information on the distribution of pollution in urban areas this is being supplemented by special investigations. Thus a survey in Sheffield is being undertaken in cooperation with the Department of Geography of the University to examine the build-up and dispersion of pollution over the city. The effects of topography, weather conditions, and relation of industry to housing are being examined.

Removal of Oxides of Sulphur from Flue gas

While it is recognized that it would be impracticable, economically and technically, to contemplate the universal application of methods of removing oxides of sulphur from flue gas, it is considered that if a suitable process were available it might have limited but important applications. The general problem of desulphurizing flue gas with carbon is therefore being investigated with, at the moment, particular attention to the removal of sulphuric acid mist, as, in one instance, the Laboratory has used the method successfully on a large scale.

The International Union of Air Pollution Prevention Associations

The International Union that has now been established consists of non-governmental organisations only. Its primary functions are to promote collaboration and the exchange of information on air pollution problems, and to organize, through its member associations, international congresses. Particulars of the six founder member associations are given below.

Air Pollution Control Association of America. 4400 Fifth Avenue, Pittsburgh, Pennsylvania 15213.

Established in 1907, with a full-time secretariat since 1950. The Association is a voluntary, co-operative, non-profit organization of 2,7000 members who include engineers, scientists, enforcement officials, industrial organization and manufacturers. The Association serves as a forum for discussion of air pollution problems with technical orientation.

It publishes the monthly *Journal of the Air Pollution Control Association*, as well as its *APCA Abstracts*. The Abstracts contain summaries from 800 technical journals throughout the world of current air pollution literature.

The Association, governed by a body of 17 members of the Board of Directors, has the purposes of fostering the control of air pollution and improving sanitation of the air. The Association's Technical Council, composed of 40 volunteer committees, works towards international adoption of reasonable engineering performance standards. In addition to members from the United States, the Association presently has members from 35 other countries.

President, 1964-65: Dr. E. R. Hendrickson.

Executive Secretary: Arnold Arch.

Asociación Argentina Contra la Contaminación del Aire. Sarmiento 680, Buenos Aires, Argentina.

Founded in 1962 as a result of the first Latin American Conference on Air Pollution, and obtained the legal status of a civil association in 1964.

The present membership of 100 includes doctors in medicine, hygiene and chemistry; sanitary engineers, army officers, executives and industrial enterprises. Though non-governmental, many of the members are civil service officers. A grant is made to the association by the municipality of Buenos Aires.

The aims are for the public welfare and to promote the fight against air pollution in the urban and industrial centres of the country, employing scientific, educational and cultural means. At present an international conference is being organized to take place at Buenos Aires in November, 1965.

President: Dr. Jose A. Rispoli.

Secretary-General: Dr. Damian D. Torti.

Association pour la Prévention de la Pollution Atmosphérique. 62 rue de Courcelles, Paris, 8, France.

The objects of the Association are to initiate and co-ordinate studies leading to a better understanding of the problems of air pollution; to organize investigations in the large towns with a view to determining the distribution of air pollution (for which regional groups have been set up); to co-operate with the public authorities in pollution control; to inform and instruct the public; to present exhibitions under the patronage of the Ministry of Health in the large towns; and to publish the four-monthly journal *Pollution Atmosphérique*.

President: M. le Professeur Moureu
Secretary-General: M. Y. Queret.

Heat Control Society, Japan. Kanto-Shin-Etsu Heat Control Society, 54 Takata-Oimatsu-cho, Bunkyo, Tokyo, Japan.

The purposes and activities of the Society are to conduct diagnoses of problems, lecture and training courses (including by correspondence) and other publicity activities to promote efficiency of fuels for the following purposes: (i) prevention of loss of fuels; (ii) prevention of heat losses during transmission and transportation; rationalization of combustion, gasification, distillation, heating and heat transmission; and prevention of air pollution from industrial plant.

There are seven other similar societies covering the whole area of Japan. The eight organize central conferences on heat control. Total expenditure is about £63,000 and total membership about 1,900 concerns.

President: Hirotoshi Honda.
Standing Director: Takahide Taga

National Society for Clean Air. Field House, Breams Buildings, London, E.C.4., England.

Full details of the Society will be found in the colour pages of this volume.

VDI-Kommission Reinhaltung der Luft. Düsseldorf, Prinz-Georg-Strasse, 77-79, W. Germany.

The VDI Clean Air Commission, as a specialized section of a technical and scientific association, namely the German Association of Engineers (Verein Deutscher Ingenieure), does not in itself have the character of an association. It comprises collaborators from all the branches of knowledge relating to clean air, including practice, legislation and administration.

Their functions include: determining the causes, nature and extent of air pollution; making emission limits for dust and gases; research on the emission on pollutants and on chimney heights; research on the effects of air pollution; fixing the limit values of imissions (the Maximum Imission Concentrations, or MIK); establishment or development of standard procedures for the measurement of dusts and gases both at the discharge point and at the points of emission.

There are at present in the Commission 310 independent experts and scientists working in honorary capacities on 8 committees and 55 subcommittees. The results of their work are laid down in the VDI Regulations, arranged as follows: (i) General; (ii) MIK values, (iii) dispersion of pollutants, (iv) limiting emissions, (v) analysis and measuring techniques. So far, 60 regulations have been published, 33 others are either in preparation or planning stage. The Commission also initiates research studies, of which over 100 have been started so far. More than 8 million D. Marks have been provided by public funds for this purpose. (More details of the work of the Commission are included in a leaflet "Aufbau, Aufgaben Forschung", which will be supplied on request by the Commission.)

President: Dr. H. Stephany.
Secretary: Ing. H. Krämer.

The National Industrial Fuel Efficiency Service

The National Industrial Fuel Efficiency Service, formed in May, 1954, is a non-profit organization which offers industry, local authorities and commercial property owners practical help in the use of heat and power, whatever type of fuel is used.

N.I.F.E.S. services include Heat and Power Surveys, which show by precise measurement where waste occurs in factory premises and how it can be prevented. This service is also used in plant extension or development projects. Boiler house efficiency tests and methods of increasing the efficiency of steam-raising plant. Advice on improving the efficiency of heat-using process plant, furnaces and power plants. Regular service, designed to bring a factory or premises to a high degree of efficiency in the use of fuel and to maintain it at that level. Checks on space-heating systems and advice on insulation. Advice on the Clean Air Act requirements and the reduction of smoke and grit emission. N.I.F.E.S. uses equipment specially designed by the British Coal Utilization Research Association as a basis for advice in grit emission cases. It is also used to test the operation and efficiency of grit arrestors which, under the Clean Air Act, are required to be properly maintained and used. A comprehensive series of training and refresher courses for boiler plant operators, works and plant engineers, and all those whose work is connected with fuel and steam-using plant. For the benefit of those who are unable to attend technical colleges, N.I.F.E.S. has a specially designed study course (arranged in conjunction with the College of Fuel Technology) leading to the City and Guilds of London Boiler Operator's Certificate.

All enquiries should be addressed to the appropriate Area Engineer at the address given in the Directory.

Chimney Height

The effects of air pollution are proportionate to the concentration of the pollutants, and where pollution is unavoidable (which includes the product of combustion from any fuel, and in particular the gases from sulphur-bearing fuels) it is desirable to secure the greatest dispersion possible. The only legislation to promote the dispersion of chimney gases is Section 10 of the Clean Air Act, 1956. This controls the height of chimneys, other than those of residences, shops and offices. Plans submitted in accordance with building byelaws which show that it is proposed to erect a chimney, may be rejected unless the local authority is satisfied that the chimney will be of a height "sufficient to prevent so far as practicable the smoke grit dust and gases from becoming prejudicial to health or a nuisance".

The Act gives no definition of sufficient height, which depends on the circumstances of each case. Use has been made of various formulae for determining the required height. These formulae are of some complexity and more recently a simpler form of guide has been issued by the Ministry of Housing and Local Government. (Memorandum on Chimney Heights, H.M.S.O., 1963, 1s. 3d. net.)

The calculations required first take account of the amount of sulphur dioxide emitted per hour, and assume that the efflux velocity of the flue gases will not be less than that indicated for different types of installation. The guide then shows how the "uncorrected chimney height" may be calculated. This is the height appropriate for the relevant maximum rate of SO_2 emission when account has been taken of the neighbouring sources of pollution, the local background level of pollution, and the general character of the district. The uncorrected height is never less than 40 feet.

A key of five different types of district is given and by the use of nomograms the uncorrected chimney height for very small, small, medium and large installations is read off. If the uncorrected chimney height thus determined is not less than 2½ times the height of the building to which the chimney is attached, or any other building in the immediate vicinity, no further correction need be made. If however the uncorrected height is less than 2½ times the height of such buildings, a further correction has to be made. This correction is partly based on the ratio between the greatest length and height of the building (to the ridge), since this influences the effect of down-draughts.

On a further nomogram a line is taken from the uncorrected chimney height through a point representing the building height to a reference line. From here another line is drawn through a point representing the height of the building or its greatest length, whichever is lower, to a point indicating the final height. This is subject to any adjustment that may be necessary to ensure that the chimney top is never less than 10 feet above the ridge of the building, nor less than the uncorrected height.

Estimates of Air Pollution

from the Main Uses of Fuels in Great Britain in the Year 1963

Figures are in millions of tons to the nearest 0·1 million tons for quantities of fuel, smoke, and grit and dust and to the nearest 0·01 million tons for sulphur dioxide

The table has been prepared by Dr. Albert Parker, C.B.E.

Fuel and Class of Consumer	*Quantity of Fuel*	*Pollutants Discharged*		
		Smoke	*Grit and Dust*	*Sulphur Dioxide*
Coal				
Domestic (including miners' coal)	32·0	1·1	0·1	0·82
Electricity works	66·8	small	0·3	2·04
Railways	4·9	0·1	0·1	0·14
Industrial and miscellaneous	41·8	0·2	0·3(*a*)	1·20
Coke ovens	23·5	small	small	0·08
Gas works	22·1	small	small	0·16
	191·1			
Coke (excluding consumption in gas works and blast furnaces)				
Domestic, including other carbonised solid fuels	5·9	nil	small	0·12
Industrial and miscellaneous	9·3	nil	small	0·22
	—	1·4	0·8	4·78
Oil				
Domestic				
Kerosene and domestic fuel oils	2·1	very small	nil	0·01
Industrial				
Kerosene, gas/diesel oils, fuel oils, and creosote-pitch	30·8(*b*)	small	nil	1·48
Road and Rail Transport				
Motor spirit, gas/diesel oils and fuel oils	13·1	small	nil	0·06
Marine Craft				
Gas/diesel oils and fuel oils	1·1	small	nil	0·04
	47·1(*c*)	small	nil	1·59
Total for coal and oil	—	1·4	0·8	6·37

(*a*) Excluding grit and dust emissions, estimated at about 0·4 million tons from industrial processes other than steam rising.

(*b*) The amount of 30·8 million tons of oil is equivalent in heating value to about 52 million tons of coal, which if used for the same purposes would have produced about 0·2 million tons of smoke, 0·3 million tons of grit and dust, and 1·5 million tons of sulphur dioxide.

(*c*) The amount of 47·1 million tons of oil is equivalent to about 80 million tons of coal, so that the coal equivalent of the coal and oil consumed (excluding air transport) in Great Britain in 1963 was about 271 million tons.

Solid Smokeless Fuels

To an industrial civilization coke is a vital material. Without it the immense developments in the 19th and 20th Centuries would have been impossible. The earliest known reference to coke in this country is in 1587, the year before the Armada, but the details of the processes used have not survived. The earliest reference to the use of special equipment to process coke from coal is in 1759. At Throckley on the River Tyne "beehive" ovens were then in use and in actual fact there is still a considerable output of coke from "beehive" ovens in the United States.

Today solid smokeless fuels are made from many different processes, coke ovens, continuous vertical retorts, intermittent vertical retorts, by low temperature carbonization processes by mild heat treatment and by the new fluidized char process, the object being to make fuels for specific purposes and to ensure that these fuels give complete satisfaction when burned in the appliances for which they were designed. Solid smokeless fuels differ in their bulk density, that is the weight of the fuel in relation to the amount of space it occupies; their reactivity and volatile content according to the class and quality of the coal from which they were made; the plant in which the coal is carbonized, and the conditions of carbonization.

Particular attention is paid to the grading and sizing of fuels for the domestic market, as this, together with their bulk density and reactivity, can affect their performance.

It is now generally realized that smokeless fuels are not coal with the goodness taken out but coal with the smoke taken out and that in actual fact these fuels when burned in approved appliances will give one third more heat per lb. than the coal from which they were originally made.

The names of the authorized solid smokeless fuels and their suitability for use in different appliances is as follows:-

NATURAL FUELS

Anthracite

Anthracite is obtained mainly from South Wales and is characterized by its hard and bright appearance and is distinguished by its high carbon and low volatile content. It is a suitable fuel for room heaters, boilers and cookers in which it will burn for many hours without attention.

The small sizes of anthracite, peas, beans or grains, are used on gravity feed central heating boilers.

Welsh Dry Steam Coal

Welsh Dry Steam Coal differs slightly from anthracite from visual inspection. It can be distinguished by its relatively high carbon content although the volatile content is slightly higher than anthracite. It is suitable for use in room heaters, boilers and cookers.

Low Volatile Steam Coal

Low Volatile Steam Coal is suitable for all types of open fires. It has a higher volatile content than Welsh Dry Steam Coal, has a high bulk density and the replenishment of the fire need not be so frequent as with the lighter fuels.

MANUFACTURED FUELS

Barnsley BurnBrite

This fuel is manufactured in coke ovens from a specially selected and prepared coal at a lower temperature and for a shorter period than other products from coke ovens, and is suitable for the approved open fire.

Smaller sizes of this fuel can be burned on room heaters, cookers and boilers.

Barnsley BurnBrite is available in parts of London, the Midlands, the North West and South Yorkshire.

Cleanglow and Phimax

These fuels are produced by different Area Gas Boards in continuous vertical retorts from specially selected coals. They are suitable for use on the open fire, are easy to ignite and burn with a flame.

Cleanglow is available in most parts of the country, although Phimax is only available in the North West.

Coalite and Rexco

Coalite and Rexco are manufactured from two different low temperature carbonization processes, specially for use on the open fire. They burn with a cheerful flame and are easy to ignite. The coal is carbonized at a lower temperature than other fuels and for a shorter period to ensure a reactive fuel.

Smaller sizes of these fuels are suitable for room heaters and boilers.

Gloco and Sebrite

These fuels are produced by the carbonization of selected coals and are carefully prepared for use in open fires which are specified for use with coke and preferably fitted with gas ignition. These fuels will not burn in old fashioned grates. Continuous vertical retort gas coke also comes within this category and is available in most parts of the country. These fuels are practically all carbon and burn with a higher emission of heat than the coals from which they were made.

Smaller sizes are also suitable for room heaters, cookers and boilers.

Sebrite is supplied only in the South East of England.

Homefire

Homefire is a six sided briquette approximately 3 in. in diameter and $\frac{1}{4}$ in. thick. This irregular shaped fuel has much the density of coal. It burns with a cheery flame without smoke in the open fire and holds its shape as it burns away completely, leaving very little ash.

Production at the present time is restricted to the Pilot Plant at Birch Coppice and at the present time is sold in certain parts of the Midlands, the North West of England and North West London. Production at the commercial plant being built at Coventry will begin during 1965.

Phurnacite

Phurnacite is carbonized ovoids made from specially selected and prepared Welsh Dry Steam Coals. Most of the volatile content is removed during the manufacturing process. The resulting smokeless ovoids burn for long periods without attention, are completely free of stone or shale and are suitable for use in stoves, boilers and cookers. The ovoids are extremely hard so that breakage and the formation of "fines" during transit is unlikely.

Phurnacine

A plant to produce Phurnacine (mild heat treated) smokeless briquettes is being constructed at Crown Fuel Works in Cardiff, and first supplies will be available in the winter of 1965/66. The briquettes are ovoid shaped, strong and dense for easy handling, and are designed principally for closed appliances upon which tests have been made with excellent results. In the main Phurnacine will supplement Phurnacite supplies and production will be geared to market demand.

Roomheat

Roomheat will be produced by a process similar to that of Homefire and is designed as a cushion shaped briquette for use especially in room heaters, although it will give equally good results in the open fire. The fuel burns smokelessly with long flames and provides an attractive radiant fire with low residual ash. Its shape allows for easy handling. Commercial production will begin at Markham, near Doncaster in mid 1965 and output capacity will be developed in accordance with demand.

Sunbrite

Sunbrite is a hard coke produced by the carbonization of selected coals at high temperature in coke ovens. It is carefully prepared and selected for domestic heating appliances and is suitable for room heaters, boilers and cookers in which it will burn for many hours without attention. It is also suitable for fires with under-floor primary air for combustion but not for other open fires.

SMOKE CONTROL AREAS

Programmes and Progress

The following lists contain the names of Local Authorities in the "Black Areas", with (1) *the target date for completion of their Smoke Control Programme,* (2) *the final acreage* (3) *acreage in operation on April* 1, 1965 (4) *total number of premises in operation on April* 1, 1965.

The figures have been compiled as accurately as possible from information received by the Society directly from some of the Local Authorities listed, from the records at the Ministry of Housing and Local Government, and from "Smoke Control" 1962-66. *Where no figures are given in columns* 1 *and* 2, *this means that the Authority in question has not submitted a programme to the Minister of Housing and Local Government.*

The figures in italics refer to acres and premises in smokeless zones established by some Local Authorities before the Clean Air Act and in areas where smoke control operates through tenancy agreements. * *indicates that, as far as we know, a programme has been deferred, suspended or delayed.*

NORTHERN

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.4.65	4 *Premises (In Oper.)* 1.4.65
Tyneside and Wearside				
Gateshead C.B.	1980	4,677	105	1,340
Newcastle C.B.	1980	11,401	3,228	10,211
South Shields C.B.	—	—	—	—
Sunderland C.B.	1980	9,013	807	10,624
Tynemouth C.B.	1987	5,000	—	—
Jarrow B.	1970	1,500	108	1,094
Wallsend B.	1975	3,544	466	3,680
Blaydon U.D.	—	—	291	735
Boldon U.D.	—	—	—	—
Felling U.D.	—	—	366	2,800
Gosforth U.D.	1970	—	—	—
Hebburn U.D.	1974	1,563	556	1,136
Longbenton U.D.	—	—	—	—
Newburn U.D.	1975	4,648	318	2,115
Ryton U.D.	—	—	—	—
Whickham U.D.	1972	6,213	13	217
Teeside				
Darlington C.B.	—	—	—	—
Middlesbrough C.B.	1974	7,131	2,520	12,637
West Hartlepool C.B.	1973	4,976	668	330
Hartlepool B.	1970	1,608	—	—
Stockton-on-Tees B.	1982	6,084	—	—
Thornaby-on-Tees B.	1971	1,993	882	435
Billingham U.D.	1966	2,092	1,042	3,830
Eston U.D.	1972	3,000	38	494

YORKSHIRE

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.4.65	4 *Premises (In Oper.)* 1.4.65
West Riding (North)				
Bradford C.B.	1975	25,503	3,079 *1,481*	20,624 *14,284*
Dewsbury C.B.	1975	6,720	567	3,842

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.4.65	4 *Premises (In Oper.)* 1.4.65
West Riding (North) (continued)				
Halifax C.B.	1977	14,081	1,635	7,960
Huddersfield C.B.	1980	14,147	2,034	6,957
Leeds C.B.	1975	40,613	4,360	29,527
Wakefield C.B.	1977	5,800	614	1,638
Batley B.	1977	4,461	803	1,589
Brighouse B.	1975	7,875	1,755	2,696
Castleford B.	—	—	34	507
Keighley B.	1970	3,238	829	5,021
Morley B.	1977	9,994	3,455	3,769
Ossett B.	1969	3,332	808	3,335
Pontefract B.	1979	4,865	611	802
Pudsey B.	1980	5,205	208	552
Spenborough B.	1972	8,600	1,829	3,978
Aireborough U.D.	1970	6,856	2,713	4,037
Baildon U.D.	1970	2,830	1,102	1,242
Bingley U.D.	1970	11,018	1,752	5,203
Denholme U.D.	—	—	—	—
Elland U.D.	1978	5,951	30	423
Featherstone U.D.	—	—	—	—
Heckmondwike U.D.	1970	697	273	963
Horbury U.D.	1969	1,280	145	450
Horsforth U.D.	1968/70	2,706	285	2,292
Knottingley U.D.	1969	2,837	710	2,481
Mirfield U.D.	1979	—	274	823
Normanton U.D.	1979	3,061	—	—
Queensbury & Shelf U.D.	1975	2,795	455	898
Rothwell U.D.	1971	10,695	460	1,063
Shipley U.D.	1974	2,184	1,252	5,060
Sowerby Bridge U.D.	1973	4,000	—	—
Stanley U.D.	—	5,169	370	310
West Riding (South)				
Barnsley C.B.	1981	7,811	414	954
Doncaster C.B.	1970	8,371	1,396	5,795
Rotherham C.B.	1973	8,000	1,068	5,234
Sheffield C.B.	1972	39,598	16,059	53,811
Conisborough U.D.	—	—	—	—
Cudworth U.D.	1975	1,746	—	—
Darfield U.D.	—	—	—	—
Darton U.D.	1972	4,718	—	—
Dearne U.D.	—	—	—	—
Dodworth U.D.	—	—	—	—
Hoyland Nether U.D.	—	—	—	—
Mexborough U.D.	—	—	—	—
Rawmarsh U.D.	—	—	—	—
Royston U.D.	—	—	—	—
Swinton U.D.	—*	—	21	200
Wath-upon-Dearne U.D.	1972	2,665	455	639
Wombwell U.D.	—	—	—	—
Worsborough U.D.	1976	1,660	—	—
Rotherham R.D.	—	—	—	—
East Riding				
Kingston-upon-Hull C.B.	1971	12,000	4,848	27,682

NORTH WESTERN

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.4.65	4 *Premises (In Oper.)* 1.4.65
South Lancashire and North-East Cheshire				
Bolton C.B.	1970	5,401	1,451 *86*	11,451 *1,050*
Bury C.B.	1971	2,168	627	2,747
Manchester C.B.	1969	27,255	9,410 *523*	52,691 *4,764*
Oldham C.B.	—	6,392	1,346	3,740
Rochdale C.B.	1971	9,556	2,830 *67*	8,515 *337*
Salford C.B.	1967	5,202	1,485 *57*	10,194 *1,859*
Stockport C.B.	1975	8,439	1,007	7,192
Wigan C.B.	1973	5,083	1,256	3,074
Altrincham B.	1973	3,519	45	547
Ashton-under-Lyne B.	1973	4,146	567	3,432
Dukinfield B.	—	1,725	616	300
Eccles B.	1970*	3,417	1,920	2,484
Farnworth B.	1974	1,504	—	—
Heywood B.	1970	8,342	1,245	3,641
Hyde B.	1975	4,170	850	6,143
Leigh B.	1971	6,359	475	3,302
Middleton B.	1981	5,170	1,128	6,587
Mossley B.	1970	1,200	54	541
Prestwich B.	1975	2,420	2,279	3,150
Radcliffe B.	—	4,915	477	843
Sale B.	1970	3,628	1,537	7,132
Stalybridge B.	1975	3,030	500	2,280
Stretford B.	1969	3,530	805	3,701
Swinton & Pendlebury B.	1975	3,363	599	2,626
Abram U.D.	—	—	—	—
Aspull U.D.	—	—	—	—
Atherton U.D.	1970	2,289	120	214
Audenshaw U.D.	1973	1,241	49	428
Blackrod U.D.	—	—	—	—
Bredbury & Romiley U.D.	1973	688	442	1,409
Chadderton U.D.	1969	3,013	987	3,775
Cheadle & Gatley U.D.	1966	5,285	2,047	6,488
Crompton U.D.	—	2,865	419	1,316
Denton U.D.	1970	2,592	1,323	6,162
Droylsden U.D.	1973	1,245	207	1,824
Failsworth U.D.	1970	1,663	204	1,931
Golborne U.D.	1975	5,765	—	—
Hindley U.D.	1979	2,612	225	999
Horwich U.D.	—	—	—	—
Ince in Makerfield U.D.	—*	—*	—	—
Irlam U.D.	—*	4,717	748	2,541
Kearsley U.D.	1975	1,720	—	—
Lees U.D.	—	—	—	—
Little Lever U.D.	—	808	—	—
Royton U.D.	1973	2,149	202	312
Tottington U.D.	—	2,544	—	—
Tyldesley U.D.	1975	5,174	—	—
Urmston U.D.	1972	3,944	404	2,595
Westhoughton U.D.	1979	5,834	120	607
Whitefield U.D.	1967	3,386	2,976	2,893
Worsley U.D.	1973	7,240	262	2,131

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.4.65	4 *Premises (In Oper.)* 1.4.65
Central Lancashire				
Blackburn C.B.	1985	8,088	774	4,563
Burnley C.B.	1971	4,695	507	4,441
Preston C.B.	1975	6,357	668 *176*	5,389 *1,918*
Accrington B.	1975	4,418	—	—
Colne B.	1976	817	86	718
Darwen B.	1975	—	279	572
Nelson B.	—*	—	—	—
Barrowford U.D.	—	—	—	—
Brierfield U.D.	—	—	—	—
Church U.D.	1980	528	194	775
Clayton-le-Moors U.D.	1975	1,060	—	—
Fulwood U.D.	1975	3,164	—	—
Great Harwood U.D.	—*	—	—	—
Oswaldtwistle U.D.	—	—	—	—
Padiham U.D.	—	976	493	1,350
Rishton U.D.	1979	1,087	—	—
Merseyside				
Birkenhead C.B.	1979	8,043	2,176	5,628
Bootle C.B.	1975	3,054	604	3,904
Liverpool C.B.	1972	27,818	10,505	45,113
St. Helens C.B.	1970	8,865	—	—
Wallasey C.B.	—	5,961	4,107	16,624
Warrington C.B.	1980	4,639	616	6,031
Bebington B.	1980	2,220	544	3,504
Ellesmere Port B.	1977	3,724	866	4,707
Widnes B.	1970	4,500	1,761	3,988
Ashton-in-Makerfield U.D.	—	—	—	—
Haydock U.D.	—	—	—	—
Huyton-with-Roby U.D.	1970	3,054	683	2,701
Kirkby U.D.	1965	2,072	502	3,346
Litherland U.D.	—	1,180	—	—
Newton-le-Willows U.D.	1978	2,800	152	1,068
Prescot U.D.	1976	748	124	1,152
Runcorn U.D.	1970	3,116	845	2,628

MIDLANDS

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.4.65	4 *Premises (In Oper.)* 1.4.65
Derby, Nottingham and Chesterfield				
Derby C.B.	1986	8,000	749	4,793
Nottingham C.B.	1975	18,364	2,444 *125*	10,039 *2,000*
Chesterfield B.	1975	8,472	1,202	4,943
Ilkeston B.	1983	3,017	—	—
Mansfield B.	1980	7,009	955	2,229
Alfreton U.D.	—	5,023	—	—
Arnold U.D.	—	—	—	—
Beeston & Stapleford U.D.	1975	6,468	2,492	5,180
Bolsover U.D.	1974	4,326	86	167
Carlton U.D.	1970	4,018	46	332
Dronfield U.D.	1970	4,567	—	—
Eastwood U.D.	—	—	—	—

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.4.65	4 *Premises (In Oper.)* 1.4.65
Derby, Nottingham and Chesterfield (continued)				
Hucknall U.D.	—	4,029	—	—
Kirkby-in-Ashfield U.D.	—	—	—	—
Long Eaton U.D.	1975	3,559	13	112
			57	*750*
Mansfield Woodhouse U.D.	—	—	—	—
Staveley U.D.	1976	6,504	—	—
Sutton in Ashfield U.D.	1982	165	—	—
West Bridgford U.D.	—	3,045	—	—
Basford R.D.	—	—	—	—
Chesterfield R.D.	1972	29,000	846	4,107
North Midlands				
Leicester C.B.	1975	16,990	2,812	15,682
West Midlands				
Birmingham C.B.	1974	51,147	4,118	32,742
			203	*1,387*
Coventry C.B.	1978	19,171	2,183	10,919
			30	*232*
Dudley C.B.	1975	4,328	1,284	7,251
Smethwick C.B.	1979	2,500	457	4,273
Walsall C.B.	1980	8,777	327	2,207
West Bromwich C.B.	1980	7,172	265	8,112
Wolverhampton C.B.	1979	—	1,302	3,616
Bilston B.	—	—	—	—
Halesowen B.	1970	5,247	659	2,883
Nuneaton B.	1978	11,767	2,896	4,037
Oldbury B.	1984	3,304	306	1,770
Rowley Regis B.	—	—	—	—
Solihull B.	1989	13,645	1,134	2,542
Stourbridge B.	1975	4,000	758	2,108
Sutton Coldfield B.	1979	13,978	270	1,234
Tipton B.	1971	2,167	178	899
Wednesbury B.	1970	959	120	1,286
Aldridge U.D.	—	9,284	743	6,891
Amblecote U.D.	1974	665	—	—
Bedworth U.D.	—	—	—	—
Brierley Hill U.D.	1974	5,000	1,177	6,112
Brownhills U.D.	—	—	70	657
Coseley U.D.	1966	—	—	—
Darlaston U.D.	—	—	—	—
Sedgley U.D.	1973	3,823	1,399	2,425
Wednesfield U.D.	1970/72	2,515	760	3,441
Willenhall U.D.	1972	2,834	417	3,049
Potteries				
Stoke-on-Trent C.B.	1980	21,209	2,071	3,902
Newcastle-under-Lyme B.	1980	8,882	1,995	3,317
Kidsgrove U.D.	1979/80	4,095	54	532

LONDON

County of London				
City of London	*completed* (1955)	677	*677*	*21,700*
Battersea M.B.	1972	2,140	578	6,387
Bermondsey M.B.	1970*	1,135	485	6,738
Bethnal Green M.B.	1964	760	694	15,486

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.4.65	4 *Premises (In Oper.)* 1.4.65
County of London (continued)				
Camberwell M.B.	1968	4,480	1,696	11,348
Chelsea M.B.	1968	660	204	8,007
Deptford M.B.	1970	1,564	810	13,154
Finsbury M.B.	1967	587	263	3,991
Fulham M.B.	1964	1,706	1,338	36,272
Greenwich M.B.	1970	3,858	573	5,905
Hackney M.B.	1966	3,287	2,710	46,764
Hammersmith M.B.	1967	2,282	926	18,242
Hampstead M.B.	1967	2,265	1,033	20,172
Holborn M.B.	*completed* (1962)	405	405	19,479
Islington M.B.	1970	3,092	1,014	20,141
Kensington M.B.	1970	2,291	863	17,462
Lambeth M.B.	1975	4,088	954	19,665
Lewisham M.B.	1966	7,015	5,440	54,826
Paddington M.B.	1968	1,408	471	21,369
Poplar M.B.	1964	1,816	929	10,374
St. Marylebone M.B.	1965	1,473	1,270	30,154
St. Pancras M.B.	1966	2,694	1,552	22,313
Shoreditch M.B.	1965	664	561	12,511
Southwark M.B.	1972	1,131	128	4,656
Stepney M.B.	1970	1,692	492	8,465
Stoke Newington M.B.	*completed* (1963)	863	863	31,123
Wandsworth M.B.	1975	9,201	2,772	22,359
Westminster M.B.	1964	2,504	2,184	31,026
Woolwich M.B.	1968	8,282	3,414	25,154
Outer London				
Croydon C.B.	1973	12,672	2,537	22,108
East Ham C.B.	1973	3,326	—	—
West Ham C.B.	—	4,680	91	1,115
Acton B.	1968	2,319	795	11,723
Barking B.	1964	3,934	3,112 *161*	19,829 *2,112*
Barnes B.	1968	2,650	1,069	7,113
Beckenham B.	1971	5,935	936	5,201
Beddington & Wallington B.	1969	3,048	1,205	4,014
Bexley B.	1975	4,869	120	1,367
Brentford & Chiswick B.	1969/70	2,449	862	5,131
Bromley B.	1975	6,519	781	3,902
Chingford B.	1974	2,868	616	4,547
Dagenham B.	1969	4,200	1,500	17,541
Dartford B.	1976	4,292	737	4,540
Ealing B.	1974	8,781	3,385	22,623
Edmonton B.	1966	3,895	1,223	10,174
Enfield B.	1972	12,400	7,787	8,399
Epsom & Ewell B. (part)	—	—	—	—
Erith B.	1975	3,859	390	3,287
Finchley B.	1969	3,478	1,449	9,577
Harrow B.	1975	12,555	1,447	12,574
Hendon B.	1975	10,371	2,690	8,616
Heston & Isleworth B.	1970	7,261	1,591	9,064
Hornsey B.	1968	2,871	1,794	18,053
Ilford B.	1972	8,411	562	4,271
Kingston-on-Thames B.	1970	1,426	457	4,338
Leyton B.	1974	2,594	908	7,317

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.4.65	4 *Premises (In Oper.)* 1.4.65
Outer London (continued)				
Malden & Coombe B.	1972	3,164	1,189	4,300
Mitcham B.	1971	2,929	821	3,320
Richmond B.	1968	4,243	2,625	8,044
Romford B.	1973*	9,342	899	2,109
Southall B.	1969	2,608	496	5,035
Southgate B.	1972	3,765	1,727	7,795
Surbiton B. (part)	—	—	—	—
Sutton & Cheam B.	1975	4,338	518	2,857
Tottenham B.	1967	3,013	1,353	23,173
Twickenham B.	1970	7,078	1,245	10,363
Walthamstow B.	1967	4,343	1,765	20,490
Wanstead & Woodford B.	1967	3,824	2,283	12,492
Wembley B.	1973	6,000	2,177	10,475
Willesden B.	1971	4,634	1,409	21,118
Wimbledon B.	1975	3,211	746	4,885
Wood Green B.	1968	1,606	1,104	8,157
Carshalton U.D.	1970	3,346	767	7,939
Chislehurst & Sidcup U.D.	—	—	223	2,418
Crayford U.D.	1967*	2,698	1,308	4,647
East Barnet U.D.	1972	2,644	918	5,847
Feltham U.D.	1969	4,925	2,497	6,854
Friern Barnet U.D.	1968	1,340	578	4,230
Hayes & Harlington U.D.	1966	5,159	4,144	14,311
Merton & Morden U.D.	1975	3,138	1,189	6,593
Penge U.D.	1970	770	115	1,533
Ruislip & Northwood U.D.	—	—	—	—

SOUTH WEST

Bristol				
Bristol C.B.	1975	26,345	5,051	18,105
South Wales and Monmouthshire				
Newport C.B.	—	—	43	651
Pontypridd			*8,141*	*12,717*

(By arrangement, only low volatile coal to be sold in the area).

No other Authority in the region has yet submitted a programme or established a smoke control area.

Local Authorities outside the Black Areas

Local Authorities outside the Black Areas who have Smoke Control Areas in operation, with total acreages and premises to 1.4.65.

	Acreage	*Premises*		*Acreage*	*Premises*
Barnet U.D.	537	2,014	Corby U.D.	440	3,566
Basildon U.D.	748	6,897	Crawley U.D.	2,768	7,058
Bedford B.	228	1,419	Crewe B.	270	1,087
Blaby R.D.	267	1,850	Elstree R.D.	500	2,877
Brentwood U.D.	109	1,371	Exeter C.B.	251	2,091
Cambridge B.	23	279	Gillingham B.	2,758	5,980
Chatham B.	657	3,506	Grantham B.	715	2,766
Cheltenham B.	588	1,493	Harlow U.D.	5,039	15,765
Cheshunt U.D.	671	2,951	Hemel Hempstead B.	400	2,239
Connah's Quay			High Wycombe B.	1,222	3,938
(Flintshire) U.D.	53	—	Hornchurch U.D.	3,557	15,424

	Acreage	*Premises*
Lancaster B.	32	746
Leamington Spa B.	841	2,414
Leek U.D.	96	18
Lincoln C.B.	1,389	408
Luton C.B.	236	3,293
Marple U.D.	69	405
Northfleet U.D.	393	1,317
Old Fletton U.D.	123	962
Oxford C.B.	798	1,698
Reading C.B.	595	3,194
Rochester B.	830	1,974
Saddleworth U.D.	227	413
Scunthorpe B.	1,947	4,343
Shrewsbury B.	379	582
Skipton U.D.	69	370
Slough B.	1,654	5,485

	Acreage	*Premises*
Southampton C.B.	184	1,399
South East Derbyshire R.D.	28	288
Southport C.B.	67	250
Staines U.D.	5,458	5,779
Thurrock U.D.	2,031	5,170
Todmorden B.	206	1,656
Warwick B.	124	1,011
Watford B.	561	1,413
Wellington U.D.	232	11
Wilmslow U.D.	257	1,803
Winsford U.D.	433	4,225
Wortley R.D.	460	1,368
Wrexham (Wales) B.	50	437
Yiewsley & W. Drayton U.D.	4,323	4,358

Scotland

Total Acreage and Premises in Operation at 1.4.65.

	Acreage	*Premises*
Barrhead	150	738
Clydebank	1,076	4,760
Coatbridge	343	2,191
Dumbarton	1,089	3,982
Dundee	2,782	9,699
East Kilbride	480	2,569
Edinburgh	4,486	16,260
Falkirk	870	2,299

	Acreage	*Premises*
Glasgow	11,589	50,086
Grangemouth	160	1,518
Kilmarnock	77	276
Midlothian County	1,070	6
Motherwell	258	1,706
Paisley	3,033	10,359
Stirling County	1,103	4,363

Summary of Smoke Control Progress
As at March 31, 1965

(1) *Region*	(2) *No. of acres covered by smoke control orders confirmed or awaiting decision*	(3) *Percentage* of total black area acreage in the region so covered*	(4) *No. of premises covered by smoke control orders confirmed or awaiting decision*	(5) *Percentage of total black area premises in the region so covered*
Northern	15,540	12·4	71,340	12·9
East and West Ridings	85,810	22·8	311,515	26·7
North Midlands	18,745	7·0	71,965	14·1
Greater London	133,500	40·8	1,231,195	46·6
North Western	88,055	22·0	389,825	22·9
Midlands	39,445	15·8	183,345	17·4
South Western	5,050	19·2	18,105	12·2
Wales and Monmouthshire	45	0·01	650	0·2
Totals	386,190	18·4	2,277,940	27·8

* The percentage shown in columns (3) and (5) above are percentages of the *total* acreage and of the *total* number of premises in the black areas concerned. In practice it may not always be necessary for the whole of a black area authority's district to be covered by smoke control orders (*e.g.* there may be some areas of open country).

Major Smog Disasters

The word " smog " was first used by the late Dr. H. A. Des Vœux, founder-president of the N.S.A.S., in 1905, to denote the combination of smoke and natural fog that in urban areas may have disastrous consequences. There are numerous cases of smog conditions resulting in a marked rise in mortality and morbidity from respiratory disorders and consequential cardiac failure. Among these incidents are the following.

London, 1873. Rise in bronchitis deaths, compared with the previous week, of 268.

London, 1880. Rise in bronchitis deaths, compared with the previous week, of 692.

London, 1891. Rise in bronchitis deaths, compared with the previous week, of 572.

Glasgow, 1909. Average number of deaths in the 3 weeks prior to the fog were 57 per week. During 5 weeks of fog or haze the deaths per week were: 138, 233, 171, 198 and 137.

Manchester and Salford, 1930-31. In December, with no fog, there were 137 respiratory disease deaths. In January there were 9 days heavy fog and 592 deaths.

Meuse Valley, 1930. 60 deaths attributed to fog, the death rate rising to 10·5 times the normal. Many cattle had to be slaughtered.

London, 1948. Bronchitis deaths in week before fog, 73; in the week of fog, 148.

Donora, U.S.A., 1948. 18 deaths in a population of 14,000. 42 per cent of the population were estimated to have suffered from illness.

London, 1952. The fog developed on Friday, 5th December and continued until 8th December. Estimated total of 4,000 deaths in the Greater London area. In the Administrative County only deaths from bronchitis rose from 121 to 872, and from heart and circulatory diseases, from 318 to 801.

London, 1956. 1,000 additional deaths attributed to January fog in the Greater London area. (*B.M.J.*, 31 *March*, 1956.)

London, 1962—Fog in London and other areas, December 3-7, with similarities to the 1952 fog, but with 750 additional deaths as compared with 4,000.

Principal References

Mortality and Morbidity during the London Fog of December, 1952. Ministry of Health Public Health Report No. 95. (This report contains a section on " Previous Fog Incidents," with a statistical appendix for those in London.)

Les Problèmes de Pollution de l'Atmosphère, Batta, Firket and Leclerc, Liége, 1937.

Air Pollution in Donora, Pa. Public Health Bulletin, No. 306, Federal Security Agency, Public Health Service, Washington.

The History of Air Pollution in Great Britain

A Chronological Table

1273	Use of coal prohibited in London as being " prejudicial to health."
1306	Royal Proclamation prohibiting artificers from using sea-coal in their furnaces. Record of the execution of one offender.
1307	Commission of Inquiry appointed to " inquire of all such who burnt sea-coal in the city or parts adjoining, and to punish them for the first offence with great fines and ransoms, and upon the second offence to demolish their furnaces."
1578	Queen Elizabeth I " findeth hersealfe greately greved and anoyed with the taste and smoke of the sea-cooles."
1648	Petition of Londoners to Parliament to prohibit the importation of coal from Newcastle on account of the injury they experienced.
1661	John Evelyn submitted his " Fumifugium, or the Smoake of London Dissipated," to Charles II.
1819	Committee appointed by Parliament to inquire how far persons using steam engines and furnaces could erect them in a manner less prejudicial to public health and comfort.
1843	A Select Committee recommended the introduction of a Bill dealing with nuisances from furnaces and steam engines.
1845	Another Select Committee reported that it was not desirable to extend the provisions of an Act beyond furnaces used for steam generation.

1847 The Town Improvement Clauses Act contained a section dealing with factory smoke.

1853-6 Smoke Abatement Acts relating to the Metropolitan area.

1866 The Sanitary Act empowered sanitary authorities to take action in cases of smoke nuisances.

1875 The Public Health Act containing a smoke abatement section on which legislation to the present day has been based.

1881 Smoke Abatement Exhibition at South Kensington organized by the Public Health and Kyrle Societies.

1882 Formation of the National Smoke Abatement Institution.

1891 The Public Health (London) Act.

1899 Formation of the Coal Smoke Abatement Society, led by Sir William Richmond, R.A. and Dr. H. A. Des Vœux (concerned mainly with London).

1909 Sheffield smoke abatement Exhibition, at which was set up the Smoke Abatement League of Great Britain (mainly for the provinces and centred later in Manchester and Glasgow).

1912 International smoke abatement Exhibition in London, organized by the Coal Smoke Abatement Society, leading to the formation of a Committee for the Investigation of Atmospheric Pollution.

1913 Smoke abatement Bill introduced in the House of Commons by A. G. C. Harvey, M.P.

1914 Smoke abatement Bill introduced in the House of Lords by Lord Newton. Withdrawn on the appointment of a Departmental Committee to investigate the problem.

1920 Committee re-formed after the war with Lord Newton as Chairman.

1921 Publication of the Final Report of the Newton Committee.

1926 Public Health (Smoke Abatement) Act by which the 1875 and 1891 Acts were amended and extended.

1927 Establishment of first regional committees of local authorities.

1929 Amalgamation of the Coal Smoke Abatement Society and Smoke Abatement League of Great Britain to form the National Smoke Abatement Society. First publication of a journal (now *Smokeless Air*) devoted to air pollution.

1936 Public Health Act, in which were included the provisions of the smoke abatement Act of 1926.

1946 Simon Report on Domestic Fuel Policy, recommending, *inter alia*, measures for domestic smoke prevention.

1946 First smokeless zone and prior approval legislation (Manchester Corporation Act).

1951 First smokeless zone established (in Coventry).

1952 Ridley Report on " Policy for the Use of Fuel and Power Resources," recommending, *inter alia*, measures for smoke prevention.

1952 London smog disaster, the most serious for many years, with a death roll of 4,000 (*q.v.*).

1953 Beaver Committee on Air Pollution set up by the Government and published an Interim Report.

1954 Final Report of the Beaver Committee.

1954 A Clean Air Bill introduced by Gerald Nabarro, M.P., and withdrawn (4th Feb., 1955) on Government undertaking to introduce their own Bill.

1955 Whole of City of London declared a smokeless zone.

1956 Clean Air Act.

1958 National Smoke Abatement Society became incorporated under new name of National Society for Clean Air.

1959 International Diamond Jubilee Clean Air Conference and Exhibition (NSCA), London.

1962 Smog episode in London and other cities. Estimated death roll of 750 in Greater London.

1962 Holborn M.B. first local authority in country to reach its final target under Clean Air Act.

1964 Amendments to Clean Air Act in Housing Act, 1964, modifying smoke control area policy. Clean Air Act (Northern Ireland).

The Cost of Air Pollution

The most recent general inquiry into the cost of air pollution in Britain was made by a sub-committee of the Committee on Air Pollution (the Beaver Committee), the findings of which were included as an appendix in the final report of the Committee in 1954. Members of the Committee have since stated that they consider the estimates to be too conservative.

The main conclusions of the Report were:

(1) The direct costs of pollution to which figures can be put ("however hazardous") are as follows:

	£m. per annum
Laundry	25
Painting and decorating ..	30
Cleaning and depreciation of buildings other than houses ..	20
Corrosion of metals	25
Damage to textiles and other goods	52·5
	152·5

It is considered that these figures are under-estimates, and as certain items have been omitted, it is concluded that the direct costs of air pollution are *of the order of at least £150 million a year.*

(2) The "loss of efficiency". The following figures are given as "a rough guess at possible orders of magnitude": £10m. a year loss to agriculture; £55m. a year loss of working efficiency in manufacturing industry; £60m. a year in other sections, including transport—altogether "the loss of efficiency resulting from pollution might be as great as the direct costs", but to avoid danger of over-estimates a figure of £100m. a year is suggested.

(3) The value of the fuel lost under the conditions which produce smoke is estimated to be £25m. to £50m. a year, but it is considered that this should not be included as one of the costs of pollution.

The total estimated cost is given as £250m. a year, equivalent to £10 per head in the black areas and £5 elsewhere throughout Great Britain, plus the value of the fuel lost.

The Clean Air Case

A Synopsis for the Guidance of Speakers, Writers, Teachers, etc.

1. Historical Background. Growth of the air pollution problem and efforts to abate it, from 1273 to the present day. (*See History table.*)

2. Nature, Sources and Causes, Smoke: Due to incomplete combustion; consists of fine carbonaceous particles and tarry droplets. (For quantities produced, *see Table.*) Note that combustible gases escaping when smoke is produced bring the total fuel losses to an equivalent of nearly 10 million tons of coal a year.

Gases: Sulphur dioxide the most harmful, especially when in association with smoke particles. Also carbon monoxide, and noxious gases and fumes from chemical processes.

Grit and dust: Mainly from industrial sources, e.g., pulverized coal and high-draught furnaces.

3. Extent and Behaviour of Pollution. Measurement of floating and deposited impurities, sulphur dioxide, and of light values. The Investigation under the Fuel Research Station, D.S.I.R. (*q.v.*)

4. Fog. Natural and smoke fogs, their formation and characteristics. The London, 1952, 1962, and other lethal smogs.

5. Effects. *Health:* Effects on respiratory system. Effects due to obstruction of natural light. Possible relationship with lung cancer. Psychological and social consequences of life in smoke-ridden environment. Effects of smog are the result of infrequent high concentration of pollution, whereas the insidious action of " normal " pollution takes place continuously.

Plant Life: Principal factors injurious to vegetation are: loss of sunlight, blocking of stomata by deposits, direct attack by chemicals, acidification of soil. Indirect effect on grazing animals through deterioration of herbage, or of poisoning in the case of fluoride pollution.

Materials: Corrosion or erosion of metals, stone, fabrics, leather, etc.

Visibility: Loss of visibility due to smoke haze and smog affecting air and surface transport.

Costs: See information on page 46

6. Prevention. *Industrial Smoke:* calls for correct equipment, maintenance and operation of plant. Value of mechanical stoking. Uses of oil, gas, electricity and smokeless solid fuel. Importance of training and certification of stokers. Instrumentation, smoke alarms, etc. Need for all-round fuel efficiency. *Dust and grit:* Use of arrestors of appropriate types: cyclones, wet washing, electrostatic precipitators. *Sulphur:* removal by coal washing, flue gas-washing and other possible means.

Domestic: By use of smokeless fuels—gas, electricity, oil or solid. *See article describing the types of solid smokeless fuel.* Need for efficient appliances. Central and district heating, whole-house warming, off-peak electrical methods, etc. Smoke control areas, purpose and national programme.

Railways and Roads: Use of diesels and electricity for the former. Need for efficient combustion and good maintenance in road vehicles, possible development of catalytic afterburners and other devices.

7. Policy, Law, etc. The present law—Clean Air Act, 1956, Public Health Act, 1936, local Acts, Road Traffic Act, 1930, Alkali, etc., Works Regulation Act, 1906, and Orders, etc. The Beaver Report and its proposals (*q.v.*). Responsibilities of local authorities and central Government. Smokeless zones and smoke control areas. Work of the Warren Spring Laboratory, Alkali Inspectorate and other organizations. Educational and publicity work of the National Society for Clean Air.

(*See also the new NSCA booklet "Clean Air Lecture Notes"*, 1*s.* 6*d.*)

Recent Books, Papers and Reports

A Selected List

Industrial

100th Annual Report on Alkali etc., Works for 1963. Chief Inspectors, pp. 84, H.M.S.O. 1964 (5s. 6d.).

Gas Purification Processes. Ed. by G. Nonhebel, pp. 894, George Newnes, London (£7 net).

A Century of Achievement. Carter, J. S. Des Voeux Memorial Lecture, Nat. Soc. for Clean Air Proc. Harrogate Conf. 1964 (25s.).

Domestic

Smoke Control Area Reports (from Scotland, North-West, North-East, Yorkshire, West Midlands, East Midlands, South-West and South-East) Nat. Soc. for Clean Air Proc. Harrogate Conf. 1964 (25s.).

Developing a Smokeless City. Batey, J. W. (Smokless Air, No. 133, Spring 1965, 197-200).

Domestic Smoke at its Worst. "Young Observer" (Smokeless Air, No. 133, Spring, 1965, 212-213)

Air Pollution in Leeds. Report of a Study Group of the National and Municipal Affairs Section of the Leeds Junior Chamber of Commerce.

Road Vehicles

Road Vehicle Pollution. Fawell, H. D. Nat. Soc. for Clean Air Proc. Harrogate Conf. 1964 (25s.).

Air Pollution in a City Street. Waller, R. E. Commins, B. T. and Lawther, P. J. (Brit. J. Industr. Med., 1965, 22, 128).

Fuel

Smokeless Fuels—the Future Supply Position. (1) Solid Smokeless Fuel, Wilkinson, F. (2) Oil, Rendall E. (3) Gas, Jones, Sir Henry, (4) Electricity, Melling, C. T. Nat. Soc. for Clean Air Proc. Harrogate Conf. 1964 (25s.).

General

The Strasbourg Conference. A First Review and Summary of the Proceedings. (Smokeless Air, No. 131, Autumn 1964, 30-43).

Atmospheric Pollution: Its Origins and Prevention. Meetham, A. R. in collab. with Bottom, D. W. and Cayton, S. 3rd revised edition. pp. 301, Pergamon Press, Oxford (70s. net).

Atmospheric Pollutants. Report of a W.H.O. Expert Committee. World

Health Organization: Technical Report Series, 1964, No. 271 pp.18, H.M.S.O. London (1s. 9d.).

Clean Air—Law and Practice. Garner, J. F., and Crow, R. K. pp. 385, Shaw & Sons, London (63s.).

Particulate Clouds, Dusts, Smokes and Mists. Green, H. L. and Lane, W. R. pp. 471, 2nd edition Spon., London, 1964 (84s. net).

Presidential Address, Parker, Dr. A. Nat. Soc. for Clean Air Proc. Harrogate Conf. 1964.

Environmental Health Aspects of Metropolitan Planning and Development. Report of a W.H.O. Expert Committee. World Health Organization Technical Report Series No. 297. pp. 66 H.M.S.O. London (6s. 8d.).

Clean Air. Notes for Teachers and Lecturers. National Society for Clean Air, (1s. 6d.).

Research and Investigation

Sulphur Dioxide. An Examination of Sulphur Dioxide as an Air Pollutant by the Technical Committee of the Nat. Soc. for Clean Air. (2s.).

Sulphur Oxides in Flue Gases and in the Atmosphere. (In German) Spengler and Michalczyk. pp. 152 VDI-Verlag. Dusseldorf (DM 18.80)

Sulfur Oxides and other Sulfur Compounds. A Bibliography with Abstracts. U.S. Dept. of Health, Education and Welfare, Public Health Service, Div. of Air Pollution, Washington, D.C. 1965. (available U.S. Government Printing Office, Washington D.C. 20402, $2.25).

Air Pollution and Town Planning. Craxford, S. R. and Weatherley, M-L. P. M. Nat. Soc. for Clean Air. Proc. Harrogate Conf. 1964 (25s.).

Air Pollution and Town Planning. Page, J. K. Nat. Soc. for Clean Air Proc. Harrogate Conf. 1964 (25s.).

Methods of Measuring and Monitoring Atmospheric Sulphur Dioxide. Hochheiser, S. (Robert A. Taft Sanitary Engineering Centre, Cincinnati, Ohio 45226). Public Health Service Publication No. 999-AP-6.

Methods of Measuring Air Pollution. O.E.C.D. Committee for Scientific Research. Organization for Economic Co-operation and Development, 2, rue Andre Pascal, Paris 16e. pp. 94 (7s. 6d.).

Effects of Air Pollution

Environmental Change and Resulting Impacts on Health. World Health Organization Technical Report Series No. 292, pp. 24, W.H.O. Geneva, 1964. (H.M.S.O. 3s. 6d. net).

Fluorosis in Cattle: Occurrence and Effects in Industrial Areas in England and Wales, 1954-57. Burns, K. N. and Allcroft, R. Animal Disease Surveys Report No. 2 (Part 1) Ministry of Agriculture, Fisheries and Food. H.M.S.O. London, 1964 (10s. net).

Report on a study of Environmental Factors Associated with Lung Cancer and Bronchitis Mortality in Areas of North East England. Wicken, A. J. and Buck, S. F., Health Surveys Unit, AGB Research Ltd. Research Paper No. 8, Tobacco Research Council, Glen House, Stag Place, London, S.W.1.

The Urban Factor in Chronic Bronchitis. Holland, W. W. and Reid, D. D. (The Lancet, Feb. 27, 1965, 445-448) (2s.).

The Cover Photograph

This striking photograph from Paris, evocative of the struggle against the drabness of the urban environment, is reproduced, with acknowledgments, from the second report of the French Committee of Technical Action against Air Pollution (C.A.T.P.A.). The report was reviewed in Smokeless Air, No. 134, Summer, 1965.

The photograph, by Photo Izis, is from "Paris de Rêves", Editions Clairefontaine et la Guilde du Livre, Lausanne.

Guide to Publications

This list of available books, reports and pamphlets on smoke prevention, atmospheric pollution and fuel usage is issued by the National Society for Clean Air as a reference guide for readers. It may also be used for ordering the publications which may be obtained either direct from the Society, or other bookseller.

Prices in brackets include postage and packing, which must be included when ordering by post, except in the case of orders over £2, which will be sent post-free. If a number of items are ordered together excess postages will be refunded. Prices quoted are those current at the date of publication, and are subject to variation.

Information about older, out-of-print, and overseas publications may be obtained from the Society on request. Most of these are in the Society's library and can be consulted, or in some cases borrowed for short periods, by arrangement.

Except where otherwise stated the publisher is the Society. H.M.S.O.—H.M. Stationery Office. The publications are numbered and orders to the Society may be made by the code number.

Legislation

Acts and Memoranda

Code No.

82. **Clean Air Act, 1956.** The latest Statute governing smoke, containing sections on dark smoke, smoke from furnaces, grit and dust from furnaces, smoke control areas, smoke nuisances, special cases, clean air council and miscellaneous provisions. (H.M.S.O., 1956) 4 & 5 Eliz. 2 Ch.52. 2s. (2s. 5d.)

83. **Clean Air Act, 1956.** Memorandum on Smoke Control Areas. (H.M.S.O., 1956) 1s. 3d. (1s. 6d.)

84. **Clean Air Act, 1956.** Memorandum on Miscellaneous Provisions. (H.M.S.O., 1956) 8d. (11d.)

85. **Amendment to Model Byelaws.** Series IV Buildings (1953) Edition. (H.M.S.O., 1956) 2d. (5d.)

80. **The Clean Air Act, 1956.** A Descriptive Summary. (N.S.C.A.) 4s. 6d. per dozen, post free. 6d. single copy.

105. **Thermal Insulation (Industrial Buildings) Act, 1957.** (5 & 6 Eliz. 2 Ch.40). (H.M.S.O., 1957) 6d. (9d.)

118. **Clean Air Act, 1956. Memorandum on Industrial Provisions.** (H.M.S.O., 1958) 1s. (1s. 3d.)

125. **Clean Air Act, 1956. Memorandum on Industrial Provisions (Scotland).** (H.M.S.O., 1959) 1s. (1s. 3d.)

187. **Clean Air Act, 1956. Memorandum on Chimney Heights.** (H.M.S.O., 1963) 1s. 3d. (1s. 6d.)

195. **Housing Act 1964.** (H.M.S.O.) 8s. 6d. (9s. 1d.)

196. **West Riding County Council (General Powers) Act, 1964.** (H.M.S.O.) 3s. (3s. 6d.)

197. **Clean Air Act (Northern Ireland) 1964. Belfast** (H.M.S.O.) 3s. 6d. (3s. 11d.)

Regulations (Statutory Instruments)

86. **Clean Air: The Smoke Control Areas (Authorized Fuels) Regulations, 1956.** Statutory Instruments, 1956 No. 2023. (H.M.S.O., 1956) 2d. (5d.)

104. **Clean Air Council Order, 1957.** Statutory Instruments No. 766, 1957. (H.M.S.O.) 3d. (6d.)

113. **Smoke Control Areas (Exempted Fireplaces) Order, 1957.** S.I. No. 541, 1957. (H.M.S.O.) 2d. (5d.)

115. **Alkali, etc., Works Order, 1958.** S.I. No. 497, 1958. (H.M.S.O.) 3d. (6d.)

117. **Dark Smoke (Permitted Periods) Regulations, 1958.** S.I. No. 498, 1958. 3d. (6d.)

119. **Dark Smoke (Permitted Periods) (Vessels) Regulations, 1958.** S.I. No. 878, 1958. (H.M.S.O.) 3d. (6d.)

120. **Clean Air Act, 1956 (Appointed Day No. 2) (Scotland) Order, 1958.** S.I. No. 1931, 1958. (H.M.S.O.) 2d. (5d.)

121. **Alkali, etc., Works (Scotland) Order, 1958.** S.I. No. 1932, 1958. (H.M.S.O.) 3d. (6d.)

122. **Dark Smoke (Permitted Periods) (Scotland) Regulations, 1958.** S.I. No. 1933, 1958. (H.M.S.O.) 3d. (6d.)

123. **Dark Smoke (Permitted Periods) (Vessels) (Scotland) Regulations, 1958.** S.I. No. 1934, 1958. (H.M.S.O.) 3d. (6d.)

137. **Smoke Control Areas (Exempted Fireplaces) Order, 1959.** S.I. No. 1207, 1959. (H.M.S.O.) 3d. (6d.)

139. **Smoke Control Areas (Exempted Fireplaces) (Scotland) Order, 1959.** S.I. No. 2264 (S.123), 1959. (H.M.S.O.) 3d. (6d.)

174. **Alkali, etc., Works Order, 1961.** S.I. No. 2261, 1961. (H.M.S.O.) 3d. (6d.)

176. **Alkali, etc., Works Order, 1963.** S.I. No. 493, 1963. (H.M.S.O.) 5d. (8d.)

191. **Clean Air: The Smoke Control Areas (Authorized Fuels) Regulations 1963.** S.I. No. 1275, 1963. (H.M.S.O., 1963) 3d. (6d.)

198. **The Alkali etc., Works (Scotland) Order, 1965.** S.I. No. 478 (S.23) 1965. (H.M.S.O.) 9d. (1s.)

199. **The Motor Vehicles (Construction and Use) Regulations 1963.** S.I. No. 1646, 1963. (H.M.S.O.) 4s. 6d. (4s. 11d.)

200. **The Motor Vehicle (Construction and Use) (Amendment) Regulations 1964.** S.I. No. 631 1964 (H.M.S.O.) 3d. (6d.)

201. **The Motor Vehicles (Construction and Use) (Amendment) (No. 2) Regulations 1964.** S.I. No. 1169, 1964. (H.M.S.O.) 1s. (1s. 3d.)

202. **The Motor Vehicles (Construction and Use) (Amendment) (No. 3) Regulations 1964.** S.I. No. 1679, 1964. (H.M.S.O.) 3d. (6d.)

203. **The Motor Vehicles (Construction and Use) (Amendment) (No. 4) Regulations 1964.** S.I. No. 1958, 1964. (H.M.S.O.) 3d. (6d.)

204. **The Building Standards (Scotland) Regulations, 1963.** S.I. No. 1897 (S. 102) 1963. (H.M.S.O.) 11s. 6d. (12s. 2d.)

Circulars

124. **Smoke Control Areas.** Circular No. 5/59 (26/1/1959). (H.M.S.O.) 6d. (9d.)

138. **Exempted Fireplaces Order, 1959.** Circular No. 44/59 (16/7/1959). (H.M.S.O.) 3d. (6d.)

164. **Use of Sticks and Paper in Smoke Control Areas.** Circular No. 28/60 (7/7/60). (H.M.S.O.) 3d. (6d.)

166. **Notification of Provisional Plans for establishing Smoke Control Areas.** Circular No. 1/61 (16/1/1961) (H.M.S.O.) 3d. (6d.)

167. **Air Pollution—Measurement and Research.** Circular No. 12/61 (10/4/1961) (H.M.S.O.) 3d. (6d.)

168. **Selection of Open Fires for Coke Burning.** Circular No. 28/61 (5/6/1961) (H.M.S.O.) 3d. (6d.)

169. **Works of Adaptation Eligible for Grant.** Circular No. 31/61 (26/6/1961) (H.M.S.O.) 3d. (6d.)

170. **Industrial Furnaces.** Circular No. 42/61 (29/8/1961) (H.M.S.O.) 2d. (5d.)

171. **Smoke Control in the Black Areas.** Circular No. 4/62 (30/1/1962) (H.M.S.O.) 5d. (8d.)

172. **Smoke Control Areas.** Circular No. 3/62 (30/1/1962) (H.M.S.O.) 1s. (1s. 3d.)

177. **Alkali, etc., Works Regulation Act, 1906.** Circular No. 23/63 (22/3/63) (H.M.S.O.)

178. **"Homes for Today and Tomorrow".** Circular No. 13/62 (H.M.S.O.) (12/2/62) 3d. (6d.)

179. **Fuel Storage in New Local Authority Housing.** Circular No. 50/62 (1/10/62) (H.M.S.O.) 3d. (6d.)

180. **Smoke Control Programmes, 1962-1966.** Circular No. 60/62. (18/12/62) (H.M.S.O.) 3d. (6d.)

181. **Gas Cokes as Open Fire Fuels.** Circular No. 7/63 (2/4/63) (H.M.S.O.) (8d.)

188. **Chimney Heights.** Circular No. 25/63 (15/5/63) (H.M.S.O.) 3d. (6d.)

190. **Smoke Control Areas.** Circular No. 69/63. (17/12/63) (H.M.S.O.) 1s. (1s. 3d.)

205. **Housing Act 1964. Section 95: Amendment of the Clean Air Act 1956.** Circular No. 46/64 (14/8/64) (H.M.S.O.) 5d. (8d.)

206. **Housing Act 1964. Designation of Direct Acting Electric Space-Heaters.** Circular No. 60/64 (18/12/64) (H.M.S.O.) 3d. (6d.)

207. **Disposal of old Motor Vehicles.** Circular No. 8/65 (11/2/65) (H.M.S.O.) 9d. (1s.)

208. **Smoke Control Areas: Supplies of Solid Smokeless Fuel.** Circular No. 13/65 (17/3/65) (H.M.S.O.) 9d. (1s.)

209. **Heating of Public Buildings.** Circular No. 46/65. (2/6/65) (H.M.S.O.)

Smoke Control Areas: Grant Arrangements. Circular No. 51/65. (29/6/65) (H.M.S.O.)

Other Government Publications

58. **Committee on Air Pollution.** The Interim Report of the Beaver Committee appointed in July, 1953, to examine the nature, causes and effects of air pollution and the efficiency of present preventive measures; to consider what further preventive measures are practicable; and to make recommendations. (Cmd. 9011.) (H.M.S.O., 1953.) 2s. 6d. (2s. 11d.)

71. **Committee on Air Pollution.** The Final Report of the Beaver Committee. (Cmd. 9322). (H.M.S.O., 1954.) 4s. 6d. (4s. 11d.)

92. **Mortality and Morbidity During the London Fog of December, 1952.** Ministry of Health, Reports on Public Health and Medical Subjects, No. 95. (H.M.S.O., 1954.) 2s. 6d. (2s. 11d.)

132. **The Efficient Use of Fuel.** (H.M.S.O., for Ministry of Power). 35s. (37s.)

44. **Housing Manual, 1949.** The official recommendations on housing practice. The section on the heat installation may be regarded as the basis of present-day smoke prevention policy. (H.M.S.O., 1949)

155. **Report of the Committee on Solid Smokeless Fuels.** (Cmd. 999, H.M.S.O., 1960). 1s. 3d. (1s. 6d.)

26. **Atmospheric Pollution in Leicester.** Report of the important scientific survey of the behaviour of pollution in the atmosphere. Atmospheric Pollution Research Technical Paper No. 1. (H.M.S.O., 1945.) 6s. (6s. 7d.)

The Investigation of Atmospheric Pollution. Reports by the Fuel Research or Warren Spring organization of the Department of Scientific and Industrial Research, co-ordinating local observations of atmospheric pollution.

75. **27th Report (1944-54).** (H.M.S.O., 1955.) 7s. 6d. (8s. 2d.)

106. **28th Report (1954-55).** (H.M.S.O., 1957.) 5s. 6d. (6s. 1d.)

134. **29th Report (1955-56).** (H.M.S.O., 1958.) 7s. (7s. 8d.)

135. **30th Report (1956-57).** (H.M.S.O., 1959). 7s. 6d. (8s. 2d.)

182. **Smoke Control (England and Wales) 1962-1966.** Summary of programmes of local authorities for establishment of Smoke Control Areas. (Cmnd. 1890, H.M.S.O.) 3s. 6d. (3s. 9d.)

189. **Domestic Fuel Supplies and the Clean Air Policy.** (Presented to Parliament by the Minister of Power, December, 1963). (Cmnd. 2231, H.M.S.O.) 1s. 6d. (1s. 9d.)

100th Annual Report on Alkali etc., Works for 1963. Chief Inspectors, pp. 84, H.M.S.O. 1964. 5s. 6d. (6s.)

General

11. **Smoke: The Problem of Coal and the Atmosphere.** Arnold Marsh. A comprehensive textbook on the causes, consequences and means for prevention of smoke. Illustrations and bibliography. (Faber and Faber Ltd., 1947.) 21s. (21s. 9d.)

13. **Smokeless Air.** The Society's quarterly magazine-type journal. News, articles, photographs, comment. 10s. per annum, post free, 2s. 6d. (2s. 11d.)

131. **Air Pollution.** Ed. M. W. Thring. (Butterworths.) 42s. (43s.)

15. **Fumifugium or the Smoake of London Dissipated.** John Evelyn. The famous diarist's well-known tract (1661) reprinted by the Society. Special tercentenary issue. Cloth bound 5s. (5s. 6d.). Paper back 2s. 6d. (2s. 9d.).

142. **New Stoker's Manual.** (National Industrial Fuel Efficiency Service.) 2s. 6d. (2s. 11d.)

183. **Air Pollution.** Edited by Arthur G. Stern. In 2 vols., pp. 656 and 586. Academic Press, New York and London. Vol. 1 (143s.). Vol. 2. (132s.).

193. **Smoke Inspector's Handbook** by A. Coe and I. M. Coe, from Clean Air Information Service, The College of Fuel Technology, 90 Talbot Road, London, N.6. Volume 1: 40s.; Volume 2: 50s. (post free).

194. **The Control of Air Pollution.** Alan Gilpin. pp. 514. Royal 8vo. London, Butterworths. 120s.

210. **Atmospheric Pollution: Its Origins and Prevention.** Meetham, A. R., in collab. with Bottom, D. W. and Cayton, S. 3rd revised edition. pp. 301, Pergamon Press, Oxford. 70s. net.

211. **Clean Air—Law and Practice.** Garner, J. F. and Crow, R. K. pp. 385, Shaw & Sons, London. 63s.

212. **Gas Purification Processes.** Ed. by G. Nonhebel, pp. 894, George Newnes, London. £7 net.

Conference Proceedings

(*Details of earlier Conference Proceedings available on request*)

61. **Glasgow Conference, 1953.** The Des Vœux Memorial Lecture—"Atmospheric Pollution in Relation to Preventive Medicine," and papers on the London Fog Disaster, Smokeless Zones, Production, Use and Availability of Solid Smokeless Fuels and the Efficient and Smokeless Combustion of Fuel Oils. 7s. 6d. (7s. 11d.)

70. **Scarborough Conference, 1954.** The Des Vœux Memorial Lecture—"Air Pollution and Plant Life," Address by Sir Hugh Beaver, Presidential Address: "The Coal Crisis and the Society," papers on Rail Transport and Smoke Abatement, the Industrial Uses of Gas and the Industrial Uses of Electricity. 7s. 6d. (7s. 11d.)

87. **Southport Conference, 1956.** The Des Vœux Memorial Lecture—"Clean Air: The Next Chapter," Presidential Address, Progress Reports, Local Authorities and the Clean Air Act, Clean Air and the Housewife. 12s. 6d. (12s. 11d.)

98. **Hastings Conference, 1957.** The Des Vœux Memorial Lecture—"Meteorology and Air Pollution," Address by the Minister of Power, Lord Mills, Presidential Address, and papers on the Administration of the Clean Air Act, Industry and the Clean Air Act, and Pollution from Road Vehicles. 12s. 6d. (12s. 11d.)

126. **Llandudno Conference, 1958.** The Des Vœux Memorial Lecture—"Clean Air, Urban Amenity, and the Growth of Towns," Address by the Minister of Housing and Local Government, Presidential Address, Industrial Aspects of the Clean Air Act, Forum on Smoke Control Areas, and papers on Air Pollution in London and its Smokeless Zones, Air Pollution and Respiratory Disease, Hazards from Airborne Radioactive Matter, and An Automatic Stoker for Central Heating 12s. 6d. (12s. 11d.)

140. **London, 1959: Diamond Jubilee International Clean Air Conference.** Containing Opening Address by Sir Graham Sutton, F.R.S.; 78 Papers on National Air Pollution Problems, Legislation, Education; Technical Problems; Observations, Investigation and Measurement; Research and International Co-operation; Discussions and Authors' Replies. 30s. (32s. 6d.). (Reprints available of some of the Papers).

144. **Harrogate Conference, 1960.** The Des Vœux Memorial Lecture—"Clean Air, Public Opinion and the Press," Address by Parliamentary Secretary, Ministry of Housing and Local Government, Series of progress reports on (1) Research and Investigation; (2) Domestic Heating; (3)

Industrial Problems, Papers on Air Pollution from Road Vehicles, and an Inquiry into the Working of the Clean Air Act. 25s. (25s. 8d.)

175. **Brighton Conference, 1961.** Opening Address by John C. George, Parliamentary Secretary, Ministry of Power. Presidential Address by Lord Cohen of Birkenhead. Reports on National Survey of Air Pollution, Furnace Operators Bill, Diesel Smoke; Papers on Industrial Aspects of the Clean Air Act, Whole House Heating, Smoke Control Areas and Transatlantic Discussion. 15s. (15s. 7d.)

213. **Harrogate Conference 1962 (Pre-Prints only).** Presidential Address by Lord Cohen of Birkenhead. Three technical papers on pollution control in the steel industry, at coking plants and from iron foundry cupolas; International Session; the 1958 Alkali Order Processes; Domestic Smoke "Questions and Answers"; Incineration and Waste Disposal. 5s. (5s. 3d.)

214. **Harrogate Conference 1964** Opening Address by the Rt. Hon. Lord Sherfield. Presidential Address by Dr. Albert Parker. Smoke Control Area Reports from 8 regions; two papers on Air Pollution and Town Planning, four papers on the future supply of smokeless fuels; Des Vœux Memorial Lecture "A Century of Achievement"; a paper on road vehicle pollution and discussion on the Sulphur Dioxide Report. 25s. (25s. 6d.)

Reprints:

Des Vœux Memorial Lectures

45. **Towards the Better Use of Coal.** Dr. D. T. A. Townend, 1950. 2s. 6d. (2s. 9d.)

77. **Air Pollution and Plant Life.** Sir Edward Salisbury, 1954. Preprints only. 6d.

78. **The Destructive Effects of Air Pollution on Materials.** Dr. A. Parker. 1955. 1s. (1s. 3d.)

90. **Clean Air: The Next Chapter.** Sir Hugh Beaver, 1956. 1s. (1s. 3d.)

102. **Meteorology and Air Pollution.** Sir Graham Sutton, 1957. 1s. (1s. 3d.)

130. **Clean Air, Urban Amenity and the Growth of Towns.** Sir William Holford, 1958. 1s. (1s. 3d.)

152. **Clean Air, Public Opinion and the Press.** Sir Linton Andrews, 1960. 1s. (1s. 3d.)

A Century of Achievement. J. S. Carter, 1964. (In Proceedings of 1964 Harrogate Conference and *Smokeless Air* No. 132, Winter 1964).

Other Reprints

145. **Some factors concerning Diesel Engine Exhaust Fumes.** J. K. Lock, 1960. 1s. (1s. 3d.)

146. **Methods of Removing Smoke from Road Vehicles.** L. E. Reed and S. C. Wallin, 1960 1s. (1s. 3d.)

147. **Sampling for 3:4 Benzpyrene in Flue Gas from Plant fired by Petroleum Fuels.** E. L. Howe, 1960. 1s. (1s. 3d.)

148. **Trends in the Pollution of the Air of Gt. Britain, 1952-59.** J. Carroll, S. R. Craxford, H. E. Newall, P. M. Weatherley, 1960. 1s. 3d. (1s. 6d.)

149. **Pollution Levels in Cities.** F. P. Williams, 1960. 1s. (1s. 3d.)

150. **Accuracy and Reliability of Instruments in Common Use for Measurement of Air Pollution.** S. R. Craxford, E. T. Wilkins, D. W. Slimming, 1960. 1s. (1s. 3d.)

151. **Reports on an Inquiry into the Working of the Clean Air Act, 1960.** 2s. 6d.

165. **Air Pollution from Road Vehicles.** Reprint of Papers and Discussions, 1960. 3s. (3s. 3d.)

185. **Mitigation of Air Pollution at Coking Plants.** R. L. Cooper and J. P. Graham, 1962. 1s. (1s. 3d.)

186. **Incineration and Waste Disposal.** S. Cayton, 1962. 1s. (1s. 3d.)

215. **Power Stations and Clean Air.** G. N. Stone and A. J. Clarke. 1963. 1s. (1s. 3d.)

216. **Air Pollution and Town Planning.** S. R. Craxford and M-L. P. M. Weatherley. 1964. 1s. (1s. 3d.)

Miscellaneous

93. **Ringelmann Smoke Chart** (with instructional leaflet). Chart for measuring smoke density. (Charles Griffin & Co. Ltd.)
1s. 2d. each, 3 for 2s. 6d., 6 for 4s. 2d., 12 for 7s. 2d., including postage.

112. **'Power's' Microringelmann.** Direct facsimile reduction of the standard Ringelmann Chart (McGraw-Hill, 1954.)
Single copies, 2s. 6d. (2s. 9d.)
27s. 6d. per dozen, post free.

217. **Sulphur Dioxide.** An Examination of Sulphur Dioxide as an Air Pollutant by the Technical Committee of the Nat. Soc. for Clean Air.
2s. (2s. 3d.)

218. **Clean Air.** Notes for Teachers and Lecturers. National Society for Clean Air. 1s. 6d. (post free)

Clean Air Wall Chart (with Notes for Teachers, as above). From Educational Productions Ltd., 17 Denbigh Street, London, S.W.1.
2s.

Films and Filmstrips

Following is a list of films and filmstrips on air pollution and its prevention, fuel efficiency, etc. Application for the loan of the films (or purchase of the filmstrips) should be made to the issuing organization, referred to in the list by its initials, the key to which is given at the end of the list. Most of the films are available free, but the question of charges should be settled with the issuing organization, to whom 2-3 weeks advance notice of hire should be given. The running time in minutes is shown. Unless otherwise indicated, the films are available in both 16 and 35 mm. sizes, with sound.

The Society welcomes information on other films suitable for inclusion in future editions of the Year Book.

Films

GENERAL AND EDUCATIONAL

Family Album. The problems of domestic life confronting successive generations of a middle-class family. 30 mins. G.C.

The Future is Electric. The place of nuclear power in smoke abatement. 28 mins. E.D.A.

The A.B.C. of Gas. An animated cartoon designed for the younger age groups, showing the evolution of coal from the prehistoric forests to its modern conversion into gas, coke and other products. 9 mins. G.C.

The First Mile Up. The experience of cities in North America making vigorous efforts to combat air pollution. Smoke prevention in Toronto. Particularly well illustrated. 16 mm. 28 mins. N.F.B.C.

DOMESTIC AND SMOKE CONTROL AREAS

The Stockton Test. An account of the conversion of four sub-standard houses to modern standards of heating, etc. 20 mins. A.I.L.

All Lit Up. Cartoon showing the advantages of the gas poker. 6 mins. G.C. (In colour).

Window to the Sky. Excellent colour film, showing technique of setting up smoke control area. Suitable for general publicity, and for showing to members of local authorities. 22 mins. G.C.

Clean Air. Colour film dealing with air pollution and showing how modern methods of domestic heating meet the requirements of the Clean Air Act. 22 mins. S-M & BP.

Arthur Clears the Air. A film in colour intended for showing at meetings where the Clean Air Act and Smokeless Zones are discussed. 27 mins. N.C.B.

French Architecture and Modern Heating. Modern solid fuel heating systems in a wide range of applications to buildings all over France are featured in this colour film which has been adapted in English by the N.C.B. Film Unit. 27 mins. N.C.B.

People Like Us. An amusing colour film about solid fuel home-heating. N.C.B.

Heating Research for Houses. A record of the important research experiment at Abbots Langley, Herts., into ways of heating houses. 28 mins. C.F.L.

Report from America: Smog. Concerted action by the inhabitants of Pittsburgh, Pennsylvania, at one time gravely affected by industrial and domestic air pollution, has eventually rid the city of lethal "smog" and ensured a pure atmosphere. This film gives an account of their campaign. 30 mins. C.F.L.

Housewarming. "The Bartons" decide to install solid smokeless fuel central heating. 17 mins. N.C.B. (In colour).

It Takes Your Breath Away. The need to speed up the implementation of the Clean Air Act is emphasized. Contains a vividly compelling sequence on the health aspects. 16 mm. 16 mins. B.M.A.

Gas in Modern Housing. Stresses the need to incorporate clean air principles in new house design. 16mm. 18 mins. G.C.

FUEL, POWER AND INDUSTRIAL

Fluidized Coal Carbonization and Hot Briquetting. To provide sufficient smokeless fuels to meet the increasing demand, the N.C.B. Coal Research Establishment has developed a new smokeless fuel. 12 mins. N.C.B.

Homefire. Smokeless fuel for the open fire. Based on small-sized smoky coal the new smokeless fuel is now in quantity production at Birch Coppice. The manufacture of the briquettes is explained non-technically. 12 mins. N.C.B. (In colour).

Using the Coal. Shows various uses of coal, and its place among modern sources of energy. 37 mins. 16 mm. only. N.C.B.

Mechanical Firing of Coal. A group of six colour films presenting the main types of mechanical stoker. Total length 60 mins. N.C.B.

Coal: Our Wasting Asset. This film deals with fuel efficiency, fuel conservation and the problem of smoke. 10 mins. N.C.B.

Saharan Venture. Methane gas from the Sahara is helping to provide Britain with abundant supplies of clean fuel. This film tells the story of the venture in colour. 28 mins. G.C.

New King Coke. Colour film on coke and its uses, especially as a smokeless fuel. 20 mins. G.C.

Oil Fuel Combustion. Shows effects of bad firing and inefficient fuel combustion. Set in a destroyer at sea. 29 mins. 16 mm. only, silent. C.F.L.

Combustion. Production of coal from wood, use in various forms and application. 32 mins. 16 mm. only, sound. I.C.

Burning your Fuel. Shows how simply heat is lost, and methods of prevention. 10 mins. 16 mm. only. N.I.F.E.S.

Firing Your Fuel. Mechanical firing for solid smokeless fuels. 8 mins. 16 mm. only. N.I.F.E.S.

Diesel Generator as a Composite Heat and Power Unit. Outlines the theory and basic methods of waste heat recovery and shows the gain of higher thermal efficiency. 35 mins. S-M. & B.P.

Atomization. Discusses the technical aspects of combustion of oil fuels. S-M & B.P.

Combustion and the Chain Grate Stoker. Shows chemical and physical principles of coal, combustion, and their application in chain grate stoker. 25 mins. B. & W.

Pulverized Fuel. Deals with principles of pulverized fuel use. 40 mins. B. & W.

Industrial Electric Heating. Colour film on the use of electricity for industrial heating processes. 30 mins. E.D.A.

You and Your Fuel. This film attempts to show the many variations in the quality of coal, due to natural causes and why all the dirt and water cannot be removed before the coal is delivered to the customer. 16 mm. only. N.I.F.E.S.

You and Your Diesel. The importance of maintenance for diesel-engined lorries and tractors. In colour. 35 mins. S-M. & B.P.

Combustion. An instructional film for service engineers and boilerhouse staff. 30 mins. J.H.

Steam and Steam Generation. Film deals with the properties of steam, early boiler design and the modern steam generator design. 16 mm. silent. 31 mins. I.C.

The Low Ram Stoker. Comparison of hand firing practice and a modern design of automatic stoker. In colour. 16 mm. 18 mins. Shortened version 6 mins. J.H.

Gas Flow. Research into the effects of various types of flue baffles and bridge heights. 16 mm. 7 mins. J.H.

Air Flow. Experiments on the hydraulic flow model applied to the Chain Grate stoker. 16 mm. 9 mins. J.H.

The Properties of Coal. Explains difference between various coal gradings. Explanation of swelling number. 16 mm. 18 mins. J.H.

Key to Issuing Organizations:

A.I.L.—Allied Ironfounders Ltd., Brook Street, London, W.1.
B.M.A.—British Medical Association, Film Library, Tavistock Square, London, W.C.1.
B. & W.—Babcock & Wilcox Ltd., Babcock House, 209 Euston Road, London, N.W.1.
C.F.L.—Central Film Library, Government Buildings, Bromyard Avenue, Acton, London, W.3.
E.D.A.—Electrical Development Association, 2 Savoy Hill, London, W.C.2.
G.C.—The Gas Council, Hyde Park House, 4-5 Grosvenor Place, London, S.W.1.
I.C.—International Combustion Ltd., 19 Woburn Place, London, W.C.1.
J.H.—James Hodgkinson (Salford) Ltd., Brettenham House, Lancaster Place, Strand, London, W.C.2.
N.C.B.—National Coal Board, Film Department, 26-28 Dorset Square, London, N.W.1.
N.F.B.C.—National Film Board of Canada, 1 Grosvenor Square, London, W.1.
N.I.F.E.S.—National Industrial Fuel Efficiency Service, 71/72 Grosvenor Street, London, W.1.
S-M. & B.P.—Shell-Mex and B.P. Ltd., Public Relations Films, Shell-Mex House, Strand, London, W.C.2.

Film Strips

Air Pollution. Black and white. Prepared in consultation with Association of Public Health Inspectors. General survey of problem, methods of measurement, etc. (prepared by Camera Talks). Available from Society, complete with lecture notes, price 2 guineas. (Quote Ref. No. CT.58). Also **The Public Health Inspector.** Colour. £2 12s. 6d. (Quote Ref. No. CT.24).

The Role of Industry. Colour. Deals with the general problem, illustrates plant and appliances for preventing smoke and grit. (Prepared by Camera Talks in conjunction with Association of Public Health Inspectors). Available from Society, complete with lecture notes, £2 12s. 6d.

Smoke Control Areas. Colour. Deals with setting up of smoke control areas. Suitable for general public, officers and members of local authorities. (Prepared by Camera Talks in conjunction with Association of Public Health Inspectors). Available from Society, complete with lecture notes, £2 12s. 6d.

Air Pollution. (A) Its nature, production and effects, and (B) its dispersion and accumulation. Two film strips in colour, each containing 32 frames. Script by R. S. Scorer, PH.D. Foreword by Sir Hugh Beaver. (Prepared by Diana Wyllie Ltd.). Available from Society, price £4 the pair. (Quote Ref. No. DW.F.22/23).

Chronic Bronchitis. Colour. Shows effects of Air Pollution in causation of Bronchitis. Lecture notes by Dr. J. L. Burn. with Appendix on Air Pollution. (Diana Wyllie Ltd., in co-operation with Pfizer Ltd.). Available from the Society, price £2.

The Clean Air Act and Oil Fuel. Semi-animated film strip in colour. 16 mm. sound. For use on film projector. Outlines position of oil fuel in relation to Clean Air Act. Available on loan from Public Relations Department, Shell-Mex and B.P. Ltd., Shell-Mex House, Strand, London, W.C.2.

Good-Bye Smog. An illustrated talk using a series of 2 in. x 2 in. slides; covers all aspects of the Clean Air Act and gives valuable advice on fuels, grants and appliances. Inquiries to:- The Women's Advisory Council on Solid Fuel, 18 South Molton Street, London, W.1.

British Standards relating to Air Pollution

B.S.		
758 :	——	Small domestic hot-water supply boilers using solid fuel 758: Part 1: 1955 Manually-controlled boilers 1958: Part 2: 1960 Thermostat-controlled boilers
893 :	——	Method of testing dust extraction plant and the emission of solids from chimneys of electric power stations
1251 :	——	Open fireplace components 1251: Part 1: 1959 Firebacks for use with inset open fires 1251: Part 2: 1959 Fireplace surrounds and hearths 1251: Part 3: 1959 Adjustable chimney-throat restrictors (insertible) 1251: Part 4: 1960 Lintels
1252 :	1957	Domestic solid fuel cookers with integral boilers
1304 :	1956	'Ready-to-fit' thermal insulating materials
1747 :	——	Methods for the Measurements of Air Pollution 1747: Part 1: 1961 Deposit Gauges 1747: Part 2: 1964 Determination of Concentration of Suspended Matter 1747: Part 3: 1963 Determination of Sulphur Dioxide 1747: Part 4: 1963 The Lead Dioxide Method
1756 :	——	Methods for the sampling and analysis of flue gases 1756: Part 1: 1963 Methods of sampling 1756: Part 2: 1963 Analysis by the Orsat apparatus
2740 :	1956	Simple smoke alarms and alarm metering devices
2741 :	1957	Recommendations for the construction of simple smoke viewers
2742 :	1958	Notes on the use of the Ringelmann Chart 2742 C: 1957 Ringelmann Chart 2742 M: 1960 Miniature smoke chart
2811 :	1957	Smoke density indicators and recorders
2845 :	——	Coke-burning inset open fires without boiler and without convection 2845: Part 1: 1957 Dimensional and constructional requirements 2845: Part 2: 1959 Performance and constructional requirements
2978 :	——	Measurements of smoke emission from industrial boilers 2978: Part 1: 1958 Medium capacity coal-fired water-tube boilers with travelling grates 2978: Part 2: 1961 Coal-fired shell boilers with various types of mechanical stokers
3107 :	1959	Small incinerators for the destruction of hospital dressings
3128 :	——	Constructional and performance requirements for inset open fires with boiler and without convection
3142 :	——	Manufactured solid smokeless fuels for household use 3142: Part 1: 1959 Cokes for domestic open fires
3250 :	——	Thermal testing of domestic solid fuel burning appliances with convection 3250: Part 1: 1960 Flue loss method 3250: Part 2: 1961 Hood method
3316 :	1960	Large incinerators for the destruction of hospital waste
3328 :	1961	Domestic gas pokers and portable underbar ignition burners
3376 :	1961	Open fire with convection, with or without boiler
3377 :	1961	Back boilers for domestic solid fuel appliances
3378 :	1961	Domestic heating stoves using coke and other solid fuels
3405 :	1961	Simplified methods of measurement of grit and dust emission from chimneys
3841 :	1965	Method for the Measurement of Smoke from Manufactured Solid Fuels for Domestic Open Fires

All the above Standards are obtainable direct from the British Standards Institution at British Standards House, 2 Park Street, London, W.1.

NOW THREE OFF-PEAK ELECTRIC HEATING SYSTEMS—

and ALL comply with the Clean Air Act

(so does electric hot water)

The Clean Air Act will bring new problems to your borough as well as solving old ones. Problems for local authorities. Problems for householders.

Fortunately, there are now three different types of "off-peak" electric heating available. They all comply with the Act. In fact, "off-peak" heating has been officially recommended by the Ministry.*

NEW HOMES:

Your Housing Department can now build two types of electric central heating into new homes:

Electric floorwarming: A very successful and widely used system in all types of building. It is very cheap to install at the construction stage, when it is built into the floor. Thereafter it has low-running costs.

Electric ducted warm air: The latest off-peak central heating system. A large storage heater uses off-peak electricity and sends out warm air along ducts. The amount of heat given out is very easily controlled. The temperature can be varied from room to room.

CONVERSIONS:

Electric unit-plan heating: Members of the public who have to change their heating arrangements will find *electric unit-plan heating* the most simple and cheap method. It is simple because only a minor wiring job is needed to install it. Cheap, because each unit costs no more than £30 wired and installed. No other method of central heating costs as little.

WATER HEATING:

Some existing forms of water heating will contravene the Act. This does not apply to electric immersion heaters. They can be easily installed in existing hot-water tanks. Self-contained electric water heaters suitable for kitchens and bathrooms can also be readily fitted.

Your local Electricity Board would welcome enquiries.

FREE LEAFLET:

The Clean Air Act will bring many enquiries from the public. Because of this a free leaflet entitled "When your neighbourhood becomes a smoke control area . . . here's how electricity can help you" has been written to inform and advise those affected. Bulk supplies are available from your Electricity Board to help you deal with these enquiries.

*Ministry of Housing and Local Government circular No. 69/63.

The tomorrow things are electric—***and you can have them TODAY***

DIRECTORY OF ORGANIZATIONS

with Air Pollution Interests

Great Britain

Alkali Inspectorate:
Chief Inspector, Ministry of Housing and Local Government, Whitehall, London, S.W.1. (Whitehall 4300, Ext. 422).
Deputy Chief Inspectors, Ministry of Housing and Local Government, Whitehall, London, S.W.1. (Whitehall 4300, Exts. 30 and 645).
Chief Inspector for Scotland, Scottish Development Department, York Buildings, Queen Street, Edinburgh, 2. (Waverley 2491).

Architects and Surveyors, Incorporated Association of, 29 Belgrave Square, London, S.W.1. (Belgravia 3755).

Architects, Royal Institute of British, 66 Portland Place, London, W.1. (Langham 5533).

Arts, Royal Society of, 6-8 John Adam Street, London, W.C.2. (Trafalgar 2366).

Bristol and West Clean Air Committee, Public Health Inspectors' Department, Bluecoat House, Sawclose, Bath, Somerset. (Bath 5411).

British Industrial Measuring and Control Apparatus Manufacturers' Association, 23/24 Margaret Street, London, W.1. (Langham 9336).

British Ironfounders' Association, 30 St. James's Square, London, S.W.1. (Whitehall 6866).

British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1. (Euston 4499).

British Standards Institution, British Standards House, 2 Park Street, London, W.1. (Mayfair 9000).

British Steel Castings Research Association, The, East Bank Road, Sheffield, 2. (Sheffield 28647).

Building Centre, The, 26 Store Street, London, W.C.1. (Museum 5400).

Building Research Station, Bucknalls Lane, Garston, Watford, Herts. (Garston, Herts. 4040).

Cast Iron Research Association, British, Bordesley Hall, Alvechurch, Birmingham. (Redditch 2715).

Chemical Engineers, Institution of, 16 Belgrave Square, London, S.W.1. (Belgravia 3647).

Chemistry, Royal Institute of, 30 Russell Square, London, W.C.1. (Langham 3482).

City and Guilds of London Institute, 76 Portland Place, London, W.1. (Langham 3050).

Civic Trust, 79 Buckingham Palace Road, London, S.W.1. (Tate Gallery 0891).

Civil Engineers, Institution of, Great George Street, London, S.W.1. (Whitehall 4577).

Clean Air Council, Ministry of Housing and Local Government, Whitehall, London, S.W.1. (Victoria 8540, Ext. 681).

Clean Air Council for Scotland, Scottish Development Department, 43 Jeffrey Street, Edinburgh, 1. (Waverley 8433).

Clean Air, National Society for:
Central Offices: Field House, Breams Buildings, London, E.C.4. (Chancery 5038).
East Midlands Division: "Sandygate", Bramcote Lane, Wollaton, Nottingham. (Nottingham 284873).
North-East Division: Health Department, Town Hall, Newcastle-upon-Tyne, 1. (Newcastle 28520).
North-West Division: Health Department, Ryecroft Hall, Audenshaw, Lancs. (Droylsden 1355).
Northern Ireland Division: Public Health Department, 414 Ormeau Road, Belfast, 7. (642905).
Scottish Division: City Chambers, Glasgow. (Glasgow Central 9600. Ext. 529).
South East Division: 12 Heath Close, Stanwell, Staines, Middx. (West Drayton 2275).
South Wales and Monmouthshire Division: Public Health Department, Municipal Offices, Greyfriars Road, Cardiff. (Cardiff 31033, Ext. 344).
West Midlands Division: Public Health Inspector's Office, Council House, Smethwick, 40. (Smethwick 1461).
Yorkshire Division: Public Health Department, 12 Market Buildings, Vicar Lane, Leeds, 1. (Leeds 30211. Ext. 29).

Coal Board, National, Hobart House, Grosvenor Place, London, S.W.1. (Belgravia 2020).

Coal Utilisation Council, 19 Rochester Row, London, S.W.1. (Victoria 2339).

Coal Utilisation Research Association, British, Randalls Road, Leatherhead, Surrey. (Leatherhead 4411).

Coke Distributors' Associations, National Federation of, Terminal House, 52 Grosvenor Gardens, London, S.W.1. (Sloane 6120).
Area Offices:
London and Counties C.D.A.: Terminal House, 52 Grosvenor Gardens, London, S.W.1. (Sloane 6129).
Midland Counties C.D.A.: Land Gear House, 2181 Coventry Road, Sheldon, Birmingham, 26. (Birmingham, Sheldon 5327).
Northern C.D.A.: 54/55 Bondgate, Darlington, Co. Durham. (Darlington 2832).
North Eastern C.D.A.: West Bar Chambers, 38 Boar Lane, Leeds, 1. (Leeds 33361).
Wales C.D.A.: 4 Dock Chambers, Bute Street, Cardiff. (Cardiff 29649).
Lancashire and District C.D.A.: Whitworth House, 115 Princess Street, Manchester, 1. (Manchester Central 3437).

Coke Oven Managers' Association, 1 Cliff Street, Mexborough, Yorks.

Coke Research Association, British, Chesterfield, Derbys. (Chesterfield 76821).

Coking Industry Association, British, 74 Grosvenor Street, London, W.1. (Mayfair 9736).

Combustion Engineering Association, 70 Jermyn Street, London, S.W.1. (Whitehall 5536).

Confederation of British Industry, 21 Tothill Street, London, S.W.1. (Whitehall 6711).

Corrosion Engineers, British Association of, P.O. Box 25, Trafalgar Square, London, W.C.2.

Council for the Protection of Rural Wales, (Cymdeithas Diogelu Harddwch Cymru), y Plas, Machynlleth, Mont. (Machynlleth 2287).

County Boroughs' Association, Town Hall, Oxford. (Oxford 49811).

County Councils Association, Eaton House, 66A Eaton Square, London, S.W.1. (Belgravia 5173).

County Councils in Scotland, Association of, 3 Forres Street, Edinburgh. (Caledonian 1626/7).

Derbyshire Clean Air Joint Consultative Committee, Town Clerk's Office, Town Hall, Chesterfield. (Chesterfield 77232).

Domestic Heating Society, The, 45 Mount Park, Carshalton, Surrey.

Domestic Solid Fuel Appliances Approval Council, 4-5 Grosvenor Place, London, S.W.1. (Belgravia 4321).

Electrical Association for Women, 25 Foubert's Place, London, W.1. (Gerrard 5212).
Electrical Development Association, British, Trafalgar Buildings, 1 Charing Cross, London, S.W.1. (Whitehall 6757).
Electrical Engineers, Institution of, Savoy Place, London, W.C.2. (Covent Garden 1871).
Electrical Research Association: Offices, Library and Laboratories, Cleeve Road, Leatherhead, Surrey. (Leatherhead 4151).
Electricity Council, 30 Millbank, London, S.W.1. (Victoria 2333).
Electricity Generating Board, Central, Sudbury House, 15 Newgate Street, London, E.C.1. (City 1202).
Electrical Vehicle Association of Great Britain Ltd., Trafalgar Buildings, 1 Charing Cross, London, S.W.1. (Whitehall 6757).

Forest Products Research Laboratory, Princes Risborough, Aylesbury, Bucks. (Princes Risborough 101–2).
Fuel, Institute of, 18 Devonshire Street, London, W.1. (Langham 7124).
Fuel Technology, The College of, 90 Talbot Road, Highgate, London, N.6. (Mountview 6972).

Gas Council, The, Hyde Park House, 4-5 Grosvenor Place, London, S.W.1. (Belgravia 4321).
Gas Engineers, Institution of, 17 Grosvenor Crescent, London, S.W.1. (Belgravia 8266).
Gas Industries, Society of British, 16 Grosvenor Crescent, London, S.W.1. (Belgravia 5632).
Great Britain, Royal Institution of, 21 Albemarle Street, London, W.1. (Hyde Park 5716).

Health Education, Central Council for, Tavistock House, Tavistock Square, London, W.C.1. (Euston 3341).
Health, Ministry of, Alexander Fleming House, Newington Causeway, London, S.E.1. (Hop 5522).
Health, Royal Society of, 90 Buckingham Palace Road, London, S.W.1. (Sloane 5134).
Heating and Ventilating Engineers, Institution of, 49 Cadogan Square, London, S.W.1. (Belgravia 7671/2/3).
Hospital Engineers, Institution of, 45 Gt. Russell Street, London, W.C.1. (Museum 0131/2).
Housing and Local Government, Ministry of, Whitehall, London, S.W.1. (Whitehall 4300). (*See also Alkali Inspectorate*).
Housing Centre Trust, 13 Suffolk Street, London, S.W.1. (Whitehall 2881).

Institute of Housing Managers, Victoria House, Southampton Row, London, W.C.1.
Iron and Steel Federation, British, Steel House, Tothill Street, London, S.W.1. (Whitehall 1030).
Iron and Steel Research Association, British, 24 Buckingham Gate, London, S.W.1. (Tate Gallery 7931).

London and Home Counties Clean Air Advisory Council, Health Department, City Hall, Victoria Street, London, S.W.1. (Tate Gallery 8070).
London Boroughs Committee, Westminster City Hall, Victoria Street, London, S.W.1. (Tate Gallery 8070).
Low Temperature Coal Distillers' Association of Great Britain Ltd., P.O. Box No. 21, Chesterfield, Derbyshire. (Bolsover 2281/6).

Manchester and District Regional Clean Air Council, Town Hall, Manchester, 2. (Manchester Central 3377, Ext. 341).
Mechanical Engineers, Institution of, 1 Birdcage Walk, London, S.W.1. (Whitehall 7476).
Medical Officers of Health, The Society of, Tavistock House South, Tavistock Square, London, W.C.1. (Euston 3923).
Medical Research Council, Air Pollution Research Unit, St. Bartholomew's Hospital Medical College, Charterhouse Square, London, E.C.1. (Clerkenwell 1537).
Meteorological Office, London Road, Bracknell, Berkshire.
Meteorological Office, Weather Centres:
Forecasts, London: Temple Bar 4311.
Glasgow: City 3451.
Manchester: Deansgate 6701.
Southampton: Southampton 28844.
Meteorological Society, Royal, 49 Cromwell Road, London, S.W.7. (Kensington 0730).
Midlands Joint Advisory Clean Air Council, Public Health Department, Walsall Street, Willenhall, Staffs. (Willenhall 65611).
Municipal Corporations, Association of, 36 Old Queen Street, Westminster, London, S.W.1. (Whitehall 9861).
Municipal Engineers, Institution of, 25 Eccleston Square, London, S.W.1. (Victoria 5082/3).

National Housing and Town Planning Council Incorporated, 42 Devonshire Street, London, W.1. (Langham 6177).
National Industrial Fuel Efficiency Service, 71 Grosvenor Street, London, W.1. (Hyde Park 9706).
Area Offices:
North Eastern: St. Paul's House, 20/22 St. Paul's Street, Leeds, 1. (Leeds 20046).
44A Great North Road, Newcastle upon Tyne, 2. (Newcastle 813776).
London and South Eastern: 24 Bruton Place, London, W.1. (Hyde Park 7687).
8 Queen Anne Terrace, Gonville Place, Cambridge. (Cambridge 56271).
Wales and South Western: Baltic House, Mountstuart Square, Cardiff. (Cardiff 33825).
9 Great George Street, Bristol, 1. (Bristol 21301).
Midland: 6 Harborne Road, Edgbaston, Birmingham, 15. (Edgbaston 4471).
Wellington House, 190 Derby Road, Nottingham. (Nottingham 44753).
North Western: 89 Oxford Street, Manchester, 1. (Manchester Central 9228).
Scotland: 6 Park Terrace, Glasgow, C.3. (Douglas 2453).
49 Meadowside, Dundee. (Dundee 22179).
Northern Ireland: 412 Antrim Road, Belfast 15. (Belfast 76246).
National Trust for Places of Historic Interest or Natural Beauty, 42 Queen Anne's Gate. London, S.W.1. (Whitehall 0211).

Oil Burner Manufacturers' Association, British, 69 Cannon Street, London, E.C.4. (City 4444).

Parliamentary and Scientific Committee, 7 Buckingham Gate, London, S.W.1. (Victoria 2608).
Petroleum, Institute of, Atmospheric Pollution Committee, 61 New Cavendish Street, London, W.1. (Langham 3583).
Power, Ministry of, Thames House South, Millbank, London, S.W.1. (Abbey 7000).
Preservation of Rural England, Council for the, 4 Hobart Place, London, S.W.1. (Belgravia 4771).

Protection of Ancient Buildings, Society for the, 55 Great Ormond Street, London, W.C.1. (Holborn 2646).

Public Health and Hygiene, Royal Institute of, 28 Portland Place, London, W.1. (Langham 2731/2).

Public Health Engineers, Institution of, 179/181 Vauxhall Bridge Road, London, S.W.1. (Victoria 3017).

Public Health Inspectors, Association of, 19 Grosvenor Place, London S.W.1. (Belgravia 5158/9).

Road Transport Engineers, The Institute of, 1 Cromwell Place, Kensington, London, S.W.7. (Kensington 3744).

Rural District Councils Association, 147 Victoria Street, Westminster, London, S.W.1. (Victoria 6176/7).

Sanitary Association of Scotland, Royal, 150 St. Vincent Street, Glasgow. (Glasgow Central 6606).

Scottish Counties of Cities Association, City Chambers, Edinburgh. (Caledonian 2424).

Scottish Development Department, 43 Jeffrey Street, Edinburgh, 1. (Waverley 8433).

Sheffield and District Clean Air Committee, Town Hall, Sheffield. (Sheffield 27241).

Shell-Mex and B.P. Ltd. Shell-Mex House, Strand, London, W.C.2. (Temple Bar 1234).

Social Service, National Council of, 26 Bedford Square, London, W.C.1. (Museum 4066).

Solid Smokeless Fuels Federation, 74 Grosvenor Street, London, W.1. (Mayfair 3327).

Standing Conference of Co-operating Bodies, Ministry of Technology, Millbank Tower, Millbank, London, S.W.1. (Victoria 2255).

Stationery Office, Her Majesty's, Atlantic House. Holborn Viaduct, London, E.C.1. (City 9876).

Structural Insulation Association, 32 Queen Anne Street, London, W.1. (Langham 7616).

Technology, Ministry of, Millbank Tower, Millbank, London, S.W.1. (Victoria 2255). See also Building Research Station, Forest Products Research Laboratory and Warren Spring Laboratory.

Tees-side Clean Air Committee, Town Clerk's Office, Municipal Buildings, Middlesbrough. (Middlesbrough 45984).

Town and Country Planning Association, 28 King Street, Covent Garden, London, W.C.2. (Temple Bar 5006).

Town Planning Institute, 26 Portland Place, London, W.1. (Museum 9107/8/9).

Urban District Councils' Association, Palace Chambers, Bridge Street, London, S.W.1. (Whitehall 4868).

Warren Spring Laboratory, (Ministry of Technology), Gunnels Wood Road, Stevenage, Herts. (Stevenage 2080).

Warwickshire Clean Air Council, Council Offices, Atherstone. (Atherstone 2401).

West Bromwich Clean Air Council, Hygiene & Cleansing Department, Shaftesbury Street, West Bromwich.

West Lancashire and Cheshire Regional Smoke Abatement Committee, c/o Health Department, Hatton Garden, Liverpool, 3. (Liverpool Central 8433. Ext. 180).

West Riding Clean Air Advisory Council, Public Health Department, 25 East Parade, Leeds, 1. (Leeds 30661).

Women of Great Britain, National Council of, 36 Lower Sloane Street, London, S.W.1. (Sloane 0619).

Women's Advisory Council on Solid Fuel, The, 18 South Molton Street, London, W.1. (Mayfair 5358).

Women's Gas Federation, 5 Grosvenor Crescent, London, S.W.1. (Belgravia 4321).

Overseas

Argentine

Asociación Argentina Contra la Contaminación del Aire, Sarimento 680, Buenos Aires.

Austria

Austrian Society of Industrial Medicine, Kinderspitalgasse 15, Vienna, 9.

Belgium

Centre Scientifique et Technique de la Construction 5 rue de la Violette, Brussels, 1.

Conseil National Contre la Pollution de l'Air, 6, Place de Martyrs, Brussels.

Society of Health and Social Medicine. Secretary: Professor Graffar, Professor of Social Medicine, Liberal University of Brussels.

Cebedair, 2, rue Armand Stévart, Liége.

Czechoslovakia

Czech Polytechnic University of Prague, Faculty of Mechanical Engineering, Department of Air Engineering, Praha 6, Technická 1902.

Czechoslovak Academy of Sciences, Institut for Physics of the Atmosphere, Praha 4, Spořilov, Boční 11.

Czechoslovak Institut of Physical Chemistry, Department of Physical Chemistry of Aerosols, Praha 2, Máchova 7.

Institut of Hygiene, Praha 10, Srobarova 48.

Power Research Institut, Praha 7, Partizánská 7a.

Research Institut of Air Engineering, Praha 10, Malešice.

Denmark

Cinderkoks Information, Raadhuspladsen 59, Copenhagen 5.

Densk Kedelforening, Vesterbrogade I.A., Copenhagen.

France

Association pour la Prévention de la Pollution Atmosphérique. M. Yvan Queret, 62 rue de Courcelles, Paris 8.

Association Technique de l'Industrie du Gaz en France, 62, rue de Courcelles, Paris, 8.

Centre d'Information pour le Développement de Conditionnement d'Air, de la Ventilation, du Filtrage de l'Air et du Dépoussierage, 38 rue Copernic, Paris 16.

Charbonnages de France, 9 Avenue Percier, Paris 8.

Institut National d'Hygiène, 11 bis rue de Milan, Paris 9.

Institut Français des Combustibles et de l'Energie, 3 rue Henri Heine, Paris 16.

Institut National de Recherche Chimique Appliquée, 12 Quai Henri IV, Paris 4.

Societé Française des Pétroles BP, 21 rue de la Bienfaisance, Paris 8.

Union Européenne de Medicine Sociale, 1 rue de Courcelles, Paris 9.

Germany

Agrikulturchemisches Institut, Heiligenhaus Bez, Am Vogelsang 14, Düsseldorf.

Bundesministerium für Gesundheitswesen, Michaelstr 10, Bad Godesberg.

Deutsche Gesellschaft für Mineralölwissenschaft und Kohlechemie e.V. Mittelweg 180, Hamburg 13.

Deutscher Stadtetag, Lindenallee 11, Köln-Mariènburg.

Deutscher Verein von Gas-und Wasserfachmännern. Beethovenstr. 17, Frankfurt (Main).

Gaswärme-Institut Essen e.V. Holbeckshof, Essen-Steele 43.

Hygienisches Institut, Gorch-Fock-Wall 15/17, Hamburg 36.

Institut für Gewerbliche Wasserwirtschaft und Luftreinhaltung e.V. Habsburgerring 2/12, Köln 5.

Institut für Grubensicherheit und Arbeitsschutz, Kirchgasse 11, Freiberg/Sa.
Institut für Technische Physik der Frauenhofer-Gesellschaft, Königstr 70/74, Stuttgart-Degerloch. Dr.-Ing. Reiher, Director.
Institut für Wasser, Boden und Lufthygiene Corrensplatz 1, Berlin 33.
Landesanstalt für Bodennutzungsschutz des Landes Nordrhein-Westfalen, Marienplatz 4, Bochum.
Ruhrkohlen-Beratung GmbH, Frau-Bertha-Krupp-Str. 4, Essen.
Staubforschungsinstitut des Hauptverbandes der Gewerblichen Berufsgenossenschaften e.V.
Langwartweg 103, Bonn. Prof. Winkel, Director.
Steinkohlenbergbauverein, Friedrichstr 2, Essen 1. Prof. Weissner.
Technischer Überwachungs-Verein Essen e.V. Steubenstr. 53, Essen 1.
Verein Deutscher Eisenhüttenleute, Breite Strasse 27, Düsseldorf.
Verein Deutscher Ingenieure (Kommission Reinhaltung der Luft), Prinz Georg Strasse 77/79, Düsseldorf. Secretary: M. Kraemer.
Vereinigung der Grosskesselbesitzer e.V. Kurfürstenstr. 27, Essen 1.

Italy

ILVA Society, Via Corsica 4, Genoa.
Institute of Hygiene, University of Ferrara, Corso Giovecca 173A, Ferrara.
Institute of Hygiene, University of Genoa, Via A. Pastore 1, Genoa.
Instituto di Ingegneria Sanitaria del Politecnico di Milano, Piazza Leonardo da Vinci 32, Milan.
Stazione Sperimentale per i Combustibili, Via G. Pascali 55, Milan.
NANS (Union of Nations for Fight against Noise and Smog) via Garibaldi 25, Turin.

Japan

Institute of Public Health, Shirokanedaimachi Shiba, Minato-ku, Tokyo.
Kanto-Shin-Etsu Heat Control Society, 54 Takata-Oimatsu-cho, Bunkyo-ku, Tokyo.

Netherlands

Atmospheric Pollution Division; 14 Duinweg, The Hague.
Central Organization/Applied Scientific Research T.N.O., Committee for Industrial Air Pollution, 12, Koningskade, The Hague.
Commission for Soil, Water, and Air, Baan 170 Rotterdam.
Research Institute for Public Health Engineering T.N.O., (Organization for Health Research T.N.O.) Industrial Air Pollution Division, 97, Schoemakerstraat Delft.
Stichting Concawe (For conservation of clean air and water from oil refinery activities in Western Europe). 700 van Alkemaadelaan, The Hague. Secretary: Mr. G. P. Liedmeier.

Norway

Institute of Hygiene, University of Oslo, Blindern, Oslo.
Røykskaderådet, c/o Ministry of Industry, Oslo.

Poland

State Institute of Hygiene, 24 Chocimska Street, Warsaw.

South Africa

National Physical Laboratory of the Council for Scientific and Industrial Research. Box 395, Pretoria, Transvaal.

Spain

Municipal Institute of Hygiene, Place de Lesseps 1. Barcelona.

Sweden

AB Svenska Fläktfabriken, Kungsgatan 18 Stockholm.

U.S.A.

Air Pollution Control Association, 4400 Fifth Avenue Pittsburgh, 13 Pa.
Air Pollution Foundation, 2556 Mission Street, San Marino, California.
Bay Area Air Pollution Control District, 1480 Mission Street, San Francisco 3, California.
Bituminous Coal Research, Inc., 121 Meyran Avenue at Forbes, Pittsburgh 13, Pa.
California State Motor Vehicle Pollution Control Board, 217 W. First Street, Los Angeles 12, California.
Los Angeles County Air Pollution Control District, 434 S. San Pedro Street, Los Angeles 13, California.
New York Dept. of Air Pollution Control, 15 Park Row, New York 38 N.Y.
Robert A. Taft Sanitary Engineering Centre, 4676 Columbia Pky., Cincinatti 26, Ohio.
U.S. Dept. of Health, Education and Welfare, Public Health Service, Division of Air Pollution, DHEW Building South, Washington 25, D.C.

U.S.S.R.

Institute of Communal Hygiene, Pogodinskaja 10, Moscow.
Medical Control Committee on Air Pollution, State Medical Commission, Moscow.
State Committee on Chemistry, Moscow.

World Health Organization

Division of Environmental Sanitation, Palais des Nations, Geneva, Switzerland.
Regional Health Officer, Office for Europe, 8 Scherfigsvej, Copenhagen, Denmark.

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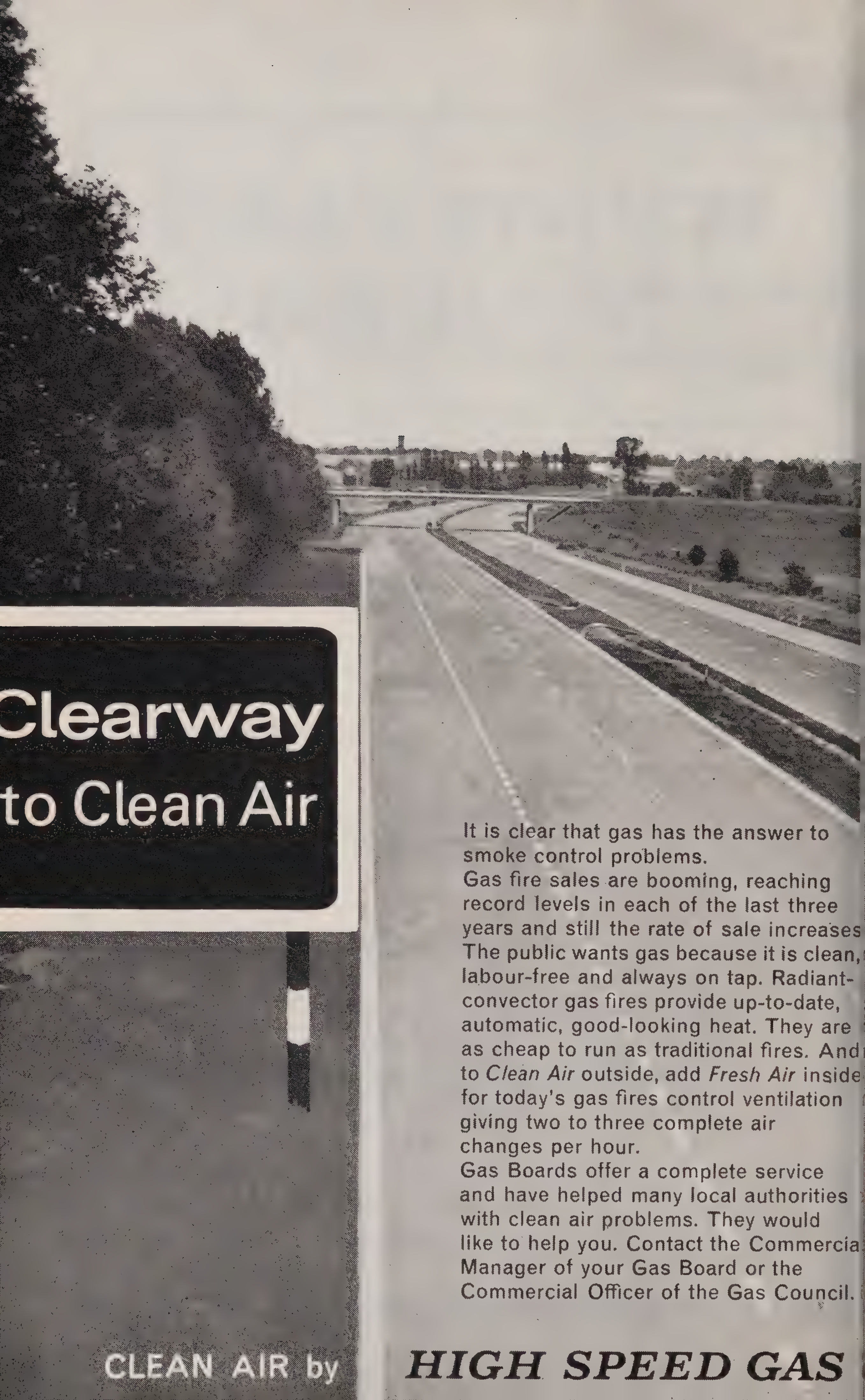

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West Midlands: S. Cayton, W. L. Kay, H. E. T. Lowbridge.

East Midlands: G. A. Hiller, T. Henry Turner, A. Wade, M.B.E.

South West: G. W. Dhenin, Alderman G. P. C. Ford (co-opted).

South East: J. Clancey (co-opted), W. Combey, G. B. Courtier, J. S. Hodgins, Dr. G. Nonhebel, L. A. Stroud, G. C. Stubbs, Dr. W. C. Turner.

South Wales and Monmouthshire: W. Bate, R. G. Coslett.

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North East: Alderman B. N. Young, *Chairman;* L. Mair, *Hon. Secretary*, Health Department, Town Hall, Newcastle-upon-Tyne, 1. Newcastle 28520.

Yorkshire: A. C. Saword, *Chairman;* James Goodfellow, *Hon. Secretary*, Public Health Dept., 12 Market Buildings, Vicar Lane, Leeds, 1. Leeds 30211, Ext. 29.

West Midlands: Councillor F. V. Magness, *Chairman;* W. L. Kay, *Hon. Secretary*, Public Health Inspector's Office, Council House, Smethwick, 40. Smethwick 1461.

East Midlands: Councillor Mrs. D. M. Ashley, *Chairman;* A. Wade, M.B.E., *Hon. Secretary*, "Sandygate," Bramcote Lane, Wollaton, Nottingham. Nottingham 284873.

South East: W. Combey, *Chairman;* J. S. Hodgins, *Hon. Secretary*, 12 Heath Close, Stanwell, Staines, Middlesex. West Drayton 2275.

South West: R. V. Redston, *Acting Hon. Secretary*, Public Health Inspector's Office, Sawclose, Bath. Bath 5411.

South Wales and Monmouthshire: Ald. Dr. C. A. Bence, *Chairman;* J. A. Church, *Hon. Secretary*, Public Health Dept., Municipal Offices, Greyfriars Road, Cardiff. Cardiff 31033, Ext. 344.

Sustaining Members

Sustaining Members are defined in the Society's Articles of Association as members of any class—Individual, Local Authority or Corporate—who make an annual contribution of £100 or more. The following were the Sustaining Members at April 30, 1963.

British Petroleum Co. Ltd.
British Electrical Development Association
British Iron and Steel Federation
British Railways Board
Central Electricity Generating Board.
Coalite and Chemical Products Ltd.
Electricity Council.
Esso Petroleum Co. Ltd.
Gas Council.
Imperial Chemical Industries Ltd.
National Coal Board.
North Thames Gas Board.
North Western Gas Board.
Shell-Mex and B.P. Ltd.
Simon Carves Ltd.
South Eastern Gas Board.
West Midlands Gas Board.
Woodall-Duckham Construction Co. Ltd

Local Authority Members

(*as at 1st July*, 1965) (Associate Members in *Italics*)

Scottish Division

Aberdeen, Airdrie, Ardrossan, *Ayr C.C.*, *Ayr*, Barrhead, Clackmannan C.C., Clydebank, Coatbridge, Dumbarton, Dumfries, Dunbarton C.C., Dundee, Dunfermline, East Kilbride, Edinburgh, Falkirk, Fife C.C., Glasgow, Grangemouth, *Hamilton*, Hawick, Inverness C.C., Inverness, Irvine, Johnstone, Kilmarnock, Kilsyth, Kirkcaldy, Kirkintilloch, Lanark C.C., Motherwell & Wishaw, Paisley, *Perth C.C.*, Perth, *Port Glasgow*, *Renfrew C.C.*, Renfrew, Rothesay, Rutherglen, Stirling C.C., Stirling, West Lothian C.C.

Northern Ireland Division

Antrim C.C., Ballymena, Belfast, Carrickfergus, Castlereagh, Londonderry.

North West Division

Abram, Accrington, Altrincham, Ashton-in-Makerfield, Ashton-under-Lyne, Atherton, Audenshaw, Bacup, Barrow-in-Furness, Bebington, *Birkenhead*, Blackburn, Blackpool, Bolton, *Bootle*, Bredbury & Romiley, Brierfield, Burnley, Bury, Buxton, Chadderton, Cheadle & Gatley, Cheshire C.C., Chester, Chorley, Church, *Clitheroe*, Colne, Connah's Quay, Crewe, Crompton, *Crosby*, *Cumberland C.C.*, Darwen, Denton, Droylsden, Dukinfield, Eccles, Ellesmere Port, Failsworth, Farnworth, Fleetwood, Flint, Fulwood, Glossop, Golborne, Great Harwood, Hale, Haslingden, Haydock, Hazel Grove & Bramhall, Heywood, Hindley, Horwich, *Hoylake*, Huyton-with-Roby, Hyde, Ince-in-Makerfield, Irlam, Kearsley, Kirkby, Lancashire C.C., Lancaster, Lees, Leigh, Leyland, Littleborough, *Liverpool*, Longdendale, Macclesfield, Manchester, Marple, Matlock, Middleton, Middlewich, Mold, Morecambe & Heysham, Nantwich, Nelson, Newton-le-Willows, Northwich R.D.C., Northwich U.D.C., Oldham, Ormskirk, Padiham, Preston, Preston R.D.C., Prestwich, Radcliffe, Ramsbottom, Rawtenstall, Rhyl, *Rishton*, Rochdale, Royton, Runcorn R.D.C., Runcorn U.D.C., St. Helens, Sale, Salford, Skelmersdale, *Southport*, Stalybridge, Standish-with-Langtree, Stockport, Stretford, Swinton & Pendlebury, *Thornton Cleveleys*, *Tintwistle*, Tyldesley, Up Holland, Urmston, Wallasey, Warrington, *Warrington R.D.C.*, *West Lancashire*, Whiston, Whitefield, Whitworth, Widnes, Wigan, Wilmslow, Winsford, Workington, Worsley, Wrexham, Wrexham R.D.C.

North East Division

Ashington, Barnard Castle, Bedlingtonshire, Billingham, Bishop Auckland, Blaydon, Brandon & Byshottles, Castle Ward, Chester-le-Street R.D.C., Chester-le-Street U.D.C., Consett, Crook & Willington, Durham, Eston, Felling, Gateshead, Gosforth, Hartlepool, Hebburn, Hetton, Houghton-le-Spring, Jarrow, Lanchester, Longbenton, Middlesbrough, Newburn, Newcastle-on-Tyne, Northumberland C.C., Prudhoe, Redcar, Ryton, Saltburn & Marske-by-the-Sea, Seaham, Sedgefield, Shildon, Skelton & Brotton, South Shields, Spennymoor, Stanley, *Stockton-on-Tees*, Sunderland, Sunderland R.D.C., Thornaby-on-Tees, Tynemouth, Wallsend, Washington, West Hartlepool, Whickham, Whitley Bay.

Yorkshire Division

Adwick-le-Street, Aireborough, Batley, Bentley-with-Arksey, Bingley, Bradford, Bridlington, Brighouse, Castleford, Colne Valley, Conisbrough, Cudworth, Darton, Dearne, Denby Dale, Dewsbury, Doncaster, Doncaster R.D.C., Elland, Halifax, Harrogate, Heckmondwike, Hemsworth R.D.C., Hemsworth U.D.C., Hepton, Holmfirth, Horbury, Horsforth, Hoyland Nether, Huddersfield, Ilkley, *Keighley*, Kingston-upon-Hull, Knottingley, Leeds, Meltham, Mesborough, Mirfield, Morley, Normanton, North Riding C.C., Ossett, Otley, Pontefract, Pudsey, Queensbury & Shelf, Rawmarsh, Rotherham, Rothwell, Royston, *Scarborough*, Sheffield & District Clean Air Committee, Shipley, Skipton, Sowerby Bridge, Spenborough, Stanley, Swinton, Todmorden, Wakefield, Wakefield R.D.C., Wath-upon-Dearne, Wombwell, Worsbrough, Wortley, *York*.

West Midlands Division

Aldridge, Bedworth, Bilston, Birmingham, Brierley Hill, Brownhills, Burton-on-Trent, Cannock R.D.C., Cannock U.D.C., Coseley, Coventry, Darlaston, Dudley, Halesowen, Hereford, Kidderminster, Leamington Spa, Lichfield, Meriden, Newcastle-under-Lyme, Nuneaton, Oldbury, Redditch, Rowley Regis, Rugby, Rugeley, Sedgley, *Seisdon*, Smethwick, Solihull, Stafford, Staffordshire C.C., Stoke-on-Trent, Stone R.D.C., Stone U.D.C., Sutton Coldfield, Tipton, Walsall, Warwick, Warwick R.D.C., *Warwickshire C.C.*, Wednesbury, Wednesfield, *Wellington*, West Bromwich, Willenhall, Wolverhampton, Worcester.

East Midlands Division

Alfreton, Basford, Beeston & Stapleford, Belper, Bingham, Blaby, Blackwell, Bolsover, Boston, *Cambridge*, Carlton, Chesterfield, Chesterfield R.D.C., Clay Cross, Clowne, Coalville, Corby, Derby, Dronfield, Eastwood, Gainsborough, Glanford Brigg, Grantham, Great Yarmouth, Grimsby, Heanor, Hinckley, Ilkeston, Ipswich, Irthlingborough, Kettering, King's Lynn, Kirkby-in-Ashfield, Leicester, Lincoln, Long Eaton, Loughborough, Lowestoft, Mansfield, Mansfield Woodhouse, Newark, Norwich, Nottingham, *Nottinghamshire C.C.*, Old Fletton, Peterborough, *Repton*, Ripley, Rushden, Scunthorpe, Southwell, Staveley, Sutton-in-Ashfield, Swadlincote, *Wellingborough*, West Bridgford, Wisbech, Worksop, Worksop R.D.C.

South West Division

Bath, Bristol, Cheltenham, Dursley, Gloucester, Kingswood, *Poole*, *Sodbury*, Stroud, *Tewkesbury*, Thornbury, *Weston-super-Mare*, West Penwith, Weymouth & Melcombe Regis.

South East Division*

Amersham, Aylesbury, Barking, Barnet, Basildon, Bedford, Bedfordshire C.C., Bexley, Bishop's Stortford, *Bognor Regis*, *Bournemouth*, Braintree, Brighton, Bromley, Bullingdon, Bushey, Camden, Chatham, Chesham, Cheshunt, *Clacton*, Crawley, *Croyden*, Dartford, Dartford R.D.C., Dover, Ealing, Eastbourne, Eastleigh, Egham, Elstree, Enfield, Epping & Ongar, Epsom & Ewell, Esher, *Essex C.C.*, Eton, *Farnborough*, Folkestone, Gillingham, *Gosport*, Gravesend, Greenwich, Guildford, Guildford R.D.C., Hackney, Harlow, Harrow, Hastings, Havant & Waterloo, Havering, Hemel Hempstead, High Wycombe, Hillingdon, Hitchin, Hoddesdon, Horsham, Hove, *Kensington* & *Chelsea*, *Kent C.C.*, Kingston-upon-Thames, Lambeth, *Leatherhead*, Lewisham, *Littlehampton*, London, City of, Luton, *Maidenhead*, Merton, New Forest, *Newham*, Northfleet, Oxford, *Portsmouth*, *Reading*, Redbridge, *Reigate*, Richmond-upon-Thames, Rickmansworth, Rochester, Sittingbourne & Milton, Slough, *Southampton*, *Southend-on-Sea*, Southwark, Southwick, Staines, Strood, Sutton, Thurrock, *Tunbridge Wells*, Watford, Watford R.D.C., Westminster, Windsor, Windsor R.D.C., *Worthing*, Wycombe.

South Wales & Monmouthshire Division

Abercarn, Aberdare, Abertillery, Barry, Bedwas & Machen, Bedwellty, Bridgend, Caerleon, Caerphilly, Cardiff, Cardiff R.D.C., Cwmbran, Ebbw Vale, Gellygaer, Glamorgan C.C., Llanelly, Llanelly R.D.C., Llantrisant & Llantwit Fardre, Magor & St. Mellons, Merthyr Tydfil, Monmouthshire C.C., Mountain Ash, Mynyddislwyn, Neath, Newport, Penarth, Pontypool, Pontypridd, Port Talbot, Rhondda, Risca, Swansea, Tredegar, Ystradgynlais.

Overseas

Durban (South Africa), Geleen (Netherlands), Johannesburg (South Africa), Leichhardt (Australia), *Newcastle* (Australia), *Vereeniging* (South Africa).

* *This list is provisional. Many of the new London Boroughs had membership still under consideration at the time of going to press.*

35th ANNUAL REPORT

for 1964

1964 was a continuously active year for the Society. The setback in the smoke control area programme, because of the new arrangements made necessary by the changing pattern of smokeless fuel production, which is discussed in the Year Book's general progress review, has not been reflected in any lessening of interest in clean air. If anything, the difficulties have stimulated interest, and in particular have demonstrated the value of the Society as a national focal point for discussion and as a steadying influence in the face of temporary doubts and hesitations.

The Annual General Meeting

The Annual Meeting, in London on 14th April, was privileged, for the first time on such an occasion, to have an address by a Minister of the Crown, Sir Keith Joseph, Minister of Housing and Local Government. To a crowded audience of 300 at the Connaught Rooms, Sir Keith spoke largely on the domestic smoke control situation. His speech was reported in full in the Summer, 1964, issue of *Smokeless Air*. The Minister was subsequently the Society's guest at a first Annual Luncheon, also held in the Connaught Rooms.

The address followed the business meeting of the Society, at which the results of the annual elections were announced and the Annual Report and Accounts for 1963 were approved. A resolution was passed, addressed to the Minister of Housing and Local Government, urging that the Clean Air Act be amended so that the Exchequer should bear a greater proportion of the cost of conversion of appliances in smoke control areas than is now the case. (The resolution was duly submitted and a reply received stating that the same proposal had been made from a number of quarters, but that it had not been found possible to act upon it.)

Dr. R. Lessing

We have to record the death, on 2nd September, of one of the Society's most distinguished and oldest members, Dr. Rudolf Lessing. A Past-President, he had been closely associated with the Society and its parent body since 1908. He was a member of the Beaver Committee and was well-known in the field of fuel chemistry and technology. He was 88 years of age. A fuller appreciation has appeared in *Smokeless Air*, for Winter, 1964.

The Annual Conference

The Conference held at Harrogate in October must be included among the most successful. The attendance, over 1,000, was larger than any in recent years. The programme of papers and discussions was of unusual interest and included an opening address by Lord Sherfield, a session on the domestic fuel situation to which leaders of each of the four main fuel and power industries contributed, a Des Vœux Memorial Lecture by Dr. J. S. Carter, the Presidential Address by Dr. Parker, and papers by Dr. Craxford and Mrs. Weatherley of Warren Spring, Professor Page of Sheffield University, and Mr. Fawell of the Ministry of Transport. There was also a session with eight reports on the smoke control area situation by divisional representatives and mention must also be made of the thoughtful and interesting address of welcome given to the Conference by the Mayor of Harrogate, Councillor H. S. Hitchen.

The Exhibition held in conjunction with the Conference was also very successful. The exhibits were of a high standard of quality and interest, both in themselves and in the attractiveness of their display. More than usual members of the public attended the Exhibition, thanks largely to the efforts of a special committee of members in the West Riding who promoted publicity, especially through the organization of a "Television Storyboard" competition for schoolchildren, for which handsome prizes were donated by members and friends of the Society.

The Sulphur Dioxide Report

A notable piece of work carried out during the year by the Technical Committee was a study and report on "Sulphur Dioxide as an Atmospheric Pollutant". The Report was published for the Press shortly before the Conference, when it was presented by Dr. Burnett, as Chairman of the Committee, for discussion and approval. The Report has received considerable favourable attention, and many mentions and reviews in the newspapers and the technical and scientific press. Its main purpose, to help to clear up confused thought and irresponsible attitudes to the problem, appears to be succeeding well.

Executive Council and Committees

At the first meeting of the new Council after the Annual General Meeting, Mr. James Goodfellow, who has been a member of the Council for many years and the Hon. Secretary of the Yorkshire Division since its inception, was elected as Chairman in succession to Dr. J. L. Burn. Mr. T. H. Turner was re-elected as one of the Deputy Chairmen, and Mr. A. C. Saword elected as a new Deputy. The Council and its Committees have met at regular intervals during the year and have dealt with a considerable amount of business.

Publicity and Information

Publicity services have been well maintained with a supply of leaflets, posters and exhibition material. The Society took stands at the exhibitions connected with the congresses of the Royal Society for Health and the Association of Public Health Inspectors, and had a small unit at the Council of Europe during the Air Pollution Conference in Strasbourg.

During the year a pictorial chart, for use in schools, was designed in conjunction with Educational Productions Limited, together with a booklet of lecture notes for the use of teachers. These are due for publication early in 1965.

An important feature of the Society's publicity and educational work is the preparation and distribution to the Press of news stories and other releases for the Conference and Exhibition, publications and other activities and information likely to be of public interest. During 1964, 31 such releases were sent out, varying in length from a short paragraph to several pages of typescript. As a result 1,037 Press reports referring to the Society were published and received through the Press cuttings service (the total is probably higher than this), and it is interesting to receive cuttings, perhaps months after the event, from newspapers in such distant places as Hong Kong and New Zealand. Altogether 7,300 cuttings on clean air matters were received during the year, those of any importance being retained for classification and filing.

The Society also continues to co-operate with an exchange of air pollution abstracts with other organizations, both in Britain and abroad. 18 British and 17 foreign periodicals are received and kept in the Library.

The Society has co-operated in the production of a new clean air film titled "It Takes Your Breath Away". Filmed in the London area and the north of England the production, which is in black and white, has aroused considerable interest since it was first shown at the Harrogate Conference.

The Divisions

The Divisional Reports (which will follow this report when printed in the Year Book) show once again a valuable level of steady activity, with regular meetings, discussions and visits. The practice of a number of the Divisions, in meeting in different towns and so giving an impetus to the clean air cause in the areas visited, is most useful. The expenses of the Divisions are met by grants from the National Society, but the work done is entirely voluntary and appreciation should be recorded to their Councils and Chairman, and, especially, to their Honorary Secretaries. Of special note is the growth and activity of the Northern Ireland Division, following the passing of a Clean Air Act in that country, and its successful conference and exhibition in Belfast in December.

International

Participation and co-operation in international air pollution activities has been a feature of the year. Your Director was a member of one of the Working Parties set up to prepare reports for the Council of Europe's Air Pollution Conference at Strasbourg in June, and he also represented the Society (as a guest of the U.S. Public Health Dept.) at a meeting of air pollution control organizations in Washington the same month, afterwards making a brief visit to the annual congress, at Houston, Texas, of the Air Pollution Control Association of America. These three events have been reported in *Smokeless Air*. After discussions with the Board of Trade, the Society also agreed to act on behalf of British firms concerned with the manufacture of air pollution prevention equipment, in a "joint venture" British stand at an exhibition to be held at Dusseldorf in April, 1965, in conjunction with a clean air congress organized by the Air Pollution Commission of the Verein Deutscher Ingenieure.

The meeting at Washington was to consider the formation of an International Union of Air Pollution Prevention Associations. A draft constitution for such a Union was drawn up and has been submitted to the governing bodies of the six organizations concerned, all of which have agreed (with only minor amendments) to accept the constitution and to become founder-members of the Union. Membership is confined to non-governmental bodies, and the six concerned are from Argentina, France, Japan, West Germany, United Kingdom and United States.

Membership and Finance

The Financial Statement which will accompany this report will show a satisfactory balance of income over expenditure, and no significant changes from the previous year. Membership also shows little change, a small and inevitable loss of members being barely balanced by new membership. Perhaps insufficient effort is put into the task (which is a major one in some organizations) of seeking new membership, but if this is so, it is because the Society's energies are devoted instead to the wholehearted furtherance of its objectives.

The Society has benefited from a bequest made by a former Individual Member, to the extent of £5,000. One of the conditions attached to this was that the money should be expended within a period of not more than five years, and should be used directly for furthering the purposes of the Society and not regarded as capital. Such a bequest, especially at the present time, is very valuable indeed and it is hoped that other members might similarly consider remembering the Society when making their Wills.

Field House,
Breams Buildings,
London, E.C.4.

JAMES GOODFELLOW, *Chairman.*
STANLEY E. COHEN, *Hon. Treasurer.*
ARNOLD MARSH, *Director and Secretary.*

Scottish Division

The Annual General Meeting and Conference of the Scottish Division was held in Rothesay on 21 and 22 May, 1964. The principal speaker was John W. W. Peyton, M.P., Parliamentary Secretary to the Ministry of Power and his address was entitled "Clean Air and Fuel Policy".

Mr. Peyton stressed that there must be freedom of choice for the consumer and made reference to the conclusions of the White Paper on "Domestic Fuel Supplies and the Clean Air Policy". He stated that until the publication of the White Paper it had been accepted that gas coke was the basis of clean air policy. The main reason for that Paper was not that there was suddenly not enough fuel, still less a desire to back down on Clean Air, but simply to indicate that as demand for smokeless fuels increased it would be necessary for fuels other than gas coke to play an increasing part. He was aware that most of the anxieties felt by local authorities stemmed from the cost of smokeless fuels and admitted that Clean Air will certainly cost more where the open grate fuels are not in sufficient supply.

Thereafter Dr. F. W. Lohrisch, Gas Department Manager, Balfour Group, gave a technical paper devoted to the Balfour process for the production of smokeless fuel (Dr. Lohrisch's paper was reported in the Autumn, 1964, Edition of *Smokeless Air*).

In the afternoon, delegates were invited to a cruise round the Kyles of Bute on the M.V. *Gay Queen* as guests of the Town Council of Rothesay. Unfortunately, heavy rain caused the cancellation of what would have been an enjoyable trip.

On the second day of the Conference, an open forum was held and representatives of the various fuel industries answered questions on "Supply Trends in Domestic Smokeless Fuel". The proceedings closed with a luncheon for delegates and friends which was held at the Royal Hotel and Arnold Marsh gave his usual report on the Society's activities during the past year.

The classes for firemen in fuel control and boiler house practice continued to be well attended and Mr. T. M. Ashford, the Lecturer to the classes, who is a former senior smoke inspector in Glasgow, is to be congratulated for the very worthwhile job he is doing on behalf of Clean Air.

The cost of smokeless fuels in Scotland continued to be the main obstacle towards a vigorous policy by local authorities in promoting Clean Air. With a few notable exceptions, the progress in Scotland continues to be painfully slow. At the end of the year, efforts were being made by the Council to press the Secretary of State for Scotland and the Clean Air Council for Scotland to try to reduce the cost of solid smokeless fuels available. The support of the local authorities' associations was also being sought.

J. W. TRAILL, *Hon. Secretary.*

Northern Ireland Division

1964 was a good year for the Northern Ireland Division and much success attended the activities of the Divisional Council.

Of special interest was the very successful Local Authority Conference held in the City Hall, Belfast, towards the end of November, which was largely attended by members and officers of the Local Authorities, other Public Bodies, Industrialists, etc. It was a great delight and pleasure to have the President of the National Society Dr. Albert

Parker, C.B.E., The Chairman Mr. James Goodfellow, and the Director Mr. Arnold Marsh, O.B.E. present. Also of interest was the Clean Air Home Heating Exhibition held in the Wellington Hall, Belfast, during the week of the Conference. Both these events have done much to promote the cause of clean air in Northern Ireland.

On the 9 June, the Clean Air Act (N.I.) 1964 received the Royal Assent. The Act comes into operation on a day to be appointed by the Minister and the appointed day will be the 1 July, 1965.

During the year under review there was an increase in membership and with the coming into operation of the Clean Air Act the Divisional Council looks forward to a period of usefulness.

W. E. C. O'BRIEN, *Hon. Secretary.*

North-West Division

The Annual General Meeting of the Division was held in the Public Hall, Ince-In-Makerfield, on Tuesday, 25 February, 1964. The meeting was attended by 144 members of the Division, who were entertained to lunch by the North Western Electricity Board at the "Brockett Arms", Wigan. After lunch members visited the factory of the Central Wagon Co. Ltd., and saw at first hand the construction and assembly of domestic block storage heaters.

The Divisional Council met on four occasions during the year, the first meeting was held on the 24 March at Messrs. "Baxi" Ltd., Bamber Bridge. At this meeting Councillor H. W. Barnes was elected Chairman and Mr. A. Taylor was elected Deputy Chairman.

The second meeting was held in Manchester on the 17 June and the Secretary reported that Councillor H. W. Barnes was no longer Blackpool Borough's representative and could not attend future meetings of the Committee. The duty of Chairman fell on the shoulders of Mr. A. Taylor of the National Coal Board, and he has carried out that duty most ably and well.

The next two meetings were held at Ryecroft Hall, Audenshaw, on the 12 August, 1964, and at Bootle Gas Service Centre on 27 October, 1964.

Two meetings of the whole Division were held during the year, one at Partington Gas Works when 144 members of the Division were entertained to lunch by the North Western Gas Board, and afterwards members made an inspection of the coke producing plant. The second meeting was held at the Walker Art Gallery, Liverpool, on the 27 October, 1964, when Professor A. Semple, Medical Officer of Health for Liverpool, was in the chair. A panel of speakers from the various fuel interests were asked many questions, mainly on the supply position of smokeless fuel. The general picture which emerged was that there were sufficient supplies of smokeless fuels available.

The year was not one of great progress due to circular 69/63, which had the effect of slowing down the progress by local authorities, because in many instances estimates had to be re-submitted to the Ministry. In addition it had the effect of causing local authorities to pause and re-appraise their total problem from a financial point of view. There are, however, indications that this period of slow progress is over and smoke control is once more gaining impetus.

We would like to thank all members of the Division for their support during a very difficult year and hope this Division as a whole will continue to give their time and energy to the cause of Clean Air.

W. E. POLLITT, *Hon. Secretary.*

North-East Division

The Division continued throughout the year to operate under the serious disadvantage of being restricted to the one meeting as in former years. This serious disadvantage allied to the increase in problems occurring during the year in connection with the progress of Smoke Control Programmes in the North-East, did little to forward the cause of atmospheric pollution abatement. Nevertheless, interest and enthusiasm by local authorities remained apparent, although it was obvious that no major improvement could be expected unless there were more favourable financial circumstances created to enable smoke control programmes to be resumed on their former scale.

Within the Division itself a sad loss was the sudden death, in his 85th year, of Alderman John Chapman, M.B.E. a past Chairman and Vice-Chairman of the North-East

Divisional Council. Alderman Chapman was a most highly esteemed personality and was well known throughout the North-East for his strong, and often outspoken views on the question of atmospheric pollution.

The Annual (and only) Meeting of the Division was held in April in Newcastle upon Tyne, when the election of officers resulted in the unanimous re-election of Alderman B. N. Young of Gateshead as Chairman; Councillor T. Prudham of Felling U.D.C. and Mr. P. C. G. Isaac of the University of Newcastle upon Tyne as Vice-Chairmen; Mr. F. Ireland, City Treasurer, Newcastle upon Tyne as Honorary Auditor and Mr. L. Mair of Newcastle upon Tyne as Honorary Secretary and Treasurer. On the occasion of this Meeting, members of the Division were entertained to lunch by the National Coal Board in the Old Assembly Rooms, followed by an address by Mr. E. S. Milburn, Deputy Marketing Director of the Northumberland and Durham Division of the National Coal Board, who delivered a most interesting and informative address on the subject of "Group Heating for Town Centres with Solid Fuel". In the course of his address, Mr. Milburn referred to the increasingly high standards of living, better planning and labour saving which result from this type of heating and he made special reference to the first scheme prepared by the National Coal Board which was in progress in Billingham, Co. Durham.

Alderman B. N. Young, Chairman of the Division, in his address referred to difficulties in domestic smoke control which had been experienced during the year, and arising from his report it was resolved that a resolution be forwarded to the Ministry of Housing and Local Government, demanding a larger proportion of the increased burden in smoke control programmes to be borne by the central Government.

In conclusion the Chairman expressed the thanks of the Meeting to the National Coal Board for providing such an able speaker and also for the most excellent hospitality which had been enjoyed by all.

For a number of years the Annual Meeting of the Division had been held in the Tyneside area and the Honorary Secretary expressed the hope that for the convenience of Teeside members, a venue in the Southern part of the Region might be chosen for the Annual Meeting of 1965. This comment immediately produced an invitation to visit Billingham on Tees with a view to inspecting a Group Heating System in operation in that district.

During the year numerous consultations took place between the Division and various Local Authorities and this friendly co-operation as well as the support given by the local Press, is much appreciated.

L. MAIR, *Hon. Secretary.*

Yorkshire Division

During the year the Divisional Council held four meetings, in Leeds, Wakefield, Kingston-upon-Hull and Barnsley.

The Gas Council's film "Most Precious Gift" was shown to members on the 8 June at Wakefield where a visit was paid to the Economiser Works of E. Green & Son Ltd., to see the Paraclone Dust Collector demonstrated under working conditions.

On the 9 July at Kingston-upon-Hull the Council were given an official welcome by the Lord Mayor and in the afternoon visited the works of Hollis Brothers, Timber Importers to inspect a newly installed automatic boiler plant burning wood waste.

During the year the main topic of discussion was on the production, price and distribution of solid smokeless fuels and this culminated in a meeting and visit on the 18 January, 1965 to the Barnsley District Coking Co., at Worsborough where information was gained on the manufacture and properties of a reactive solid smokeless fuel—"Barnsley Burnbrite".

One of the most valuable assets of these Divisional meetings is the opportunity for discussing day to day administration of the Clean Air Act, particularly in relation to Smoke Control Areas, thus ensuring an efficient method of working.

Representatives of the Press were present at most of our meetings and visits and the resulting publicity has been very gratifying and extremely helpful in the realm of public relations.

JAMES GOODFELLOW, *Hon. Secretary.*

West Midlands Division

The Annual General Meeting held at Stoke-on-Trent on the 22 April, 1964, was particularly well attended despite the appalling weather. This was undoubtedly due to the extremely attractive programme which the authorities of that City had organized for us. We were honoured by a civic welcome by the Right Worshipful the Lord Mayor of Stoke-on-Trent, Councillor, J. Westwood, J.P. The formal business meeting followed, after which Mr. G. E. Earnshaw, M.R.S.H., M.A.P.H.I., Senior Smoke Inspector, Stoke, gave a most interesting paper—"The Potteries—Its Progression to a Cleaner Atmosphere". This was illustrated by some excellent slides and was really a most valuable historical review of the Ceramic Industry. The paper was subsequently published in *Smokeless Air* and I would commend it to anyone interested in the history of this important industry. It was a classic of its kind and will be particularly helpful to students. After lunch, members visited local pottery factories.

Many of us have been concerned for some time with the distribution of solid smokeless fuels. With the closing down of so many railway depots, this problem of distribution has become increasingly acute. We were, therefore very gratified to have the opportunity to hold our Autumn Sessional Meeting at the Pensnett Trading Estate and to be able to inspect the modern mechanized fuel depot of Messrs. Lunt, Comley and Pitt Ltd. There is an undoubted need for the establishment of many more distribution centres of this type, operated by progressive managements having the necessary expertise in handling large quantities of solid smokeless fuels.

The above-mentioned meetings have been held in furtherance of the Divisional Council's policy of affording members the opportunity to keep abreast with current developments.

During the year the Divisional Council have been concerned with such matters as Domestic Fuel Supplies, Outstanding Industrial Problems of Local Authorities and the operation of Metal Recovery Works.

W. L. KAY, *Hon. Secretary.*

East Midlands Division

Activities in the Division were well maintained and meetings were excellently supported. There was however, some disappointment at reports that a few local authorities were falling behind schedule with clean air programmes mainly because of alleged shortages of solid smokeless fuels. Every opportunity was taken with some success to dispel those fears and it is hoped that smoke control will be speeded up and that every effort will be made by all local authorities to implement their programmes.

Four general meetings were held, namely:

Mansfield—11 *March*—The Mayor (Councillor A. H. Bailey) entertained the Divisional Council and other guests to lunch and afterwards welcomed the members and delegates at the divisional meeting in the Civic Hall. An address was given by Mr. P. D. Coates, Assistant Secretary, Ministry of Housing and Local Government, on Smoke Control and the changes brought about by the recent white paper.

Peterborough—16 *April*—A civic welcome was given by The Mayor (Councillor Carl E. Hall) who for some years had been a member of the Divisional Council. An address entitled "The Alkali Act and the 1958 Order Processes" was given by W. E. Grant, B.SC., PH.D., F.R.I.C. A tour was also made of the extensive factory of Frank Perkins Ltd., manufacturers of diesel engines.

Edwinstowe—9 *July*—A visit was made to the works of Rexco Products Limited, by invitation of the National Carbonising Company Limited. Lunch was taken at the Normanton Inn, Clumber Park, by invitation of the Company. At the Annual General Meeting which followed, Councillor Mrs. D. M. Ashley was appointed Chairman of the Division for the year 1964-65, and Mr. A. Murray was appointed Deputy Chairman. An address entitled "How we make Rexco Smokeless Coal" was given by J. Kershaw, A.M.I.GAS.E., A.M.INST.F.

Corby—3 *September*—By invitation of Messrs. Stewarts and Lloyds Limited, members toured the extensive steel works. Lunch was provided by the Company and in the afternoon a coach tour of the new town was organized by the Urban District Council. The Chairman of the Council (Councillor Mrs. Marshall) welcomed the delegates at the Council's Community Centre and Dr. F. R. N. Lynch, Medical Officer of Health, Corby, addressed the meeting on "Clean Air in a New Town".

A. WADE, *Hon. Secretary.*

South East Division

After slight hesitancy in the early part of the year, due to the revised arrangements for grant, the tempo of smoke control progress gradually gathered pace and at the end of the year showed signs of complete recovery. The general view of progressive local authorities (the only variety found in the South East!) was that the new arrangements gave opportunities not only for smokeless air but for a considerable reduction in sulphur dioxide pollution. It was agreed that the steep increase in costs which would inevitably occur was not unreasonable considering the advantages to be gained, i.e. increased fuel efficiency, greater comfort in the home, additional convenience, labour saving operation and above all, cleaner air than the old arrangements could possibly have achieved.

The Council met five times and two general meetings were held. The first on the 26 February, was attended by 140 members and the subject for discussion was "Trends in Domestic Fuel usage". The meeting was addressed by Mr. T. E. B. Green, Commercial Officer, the Gas Council; Mr. R. B. Partington, A.I.E.E. Technical Liaison Officer, The British Electrical Development Council; Mr. J. J. B. Saul, Domestic Heating Supervisor, Shell-Mex & B.P., and Mr. H. Giblin, Manager, Solid Smokeless Fuels Federation, and a lively discussion followed.

On the 5 November there was an attendance of 120 members to hear Mr. P. D. Coates, of the Ministry of Housing and Local Government speak on "The Problems and Difficulties arising from Circular 69/63 and the White Paper on Smoke Control". Many members took part in the ensuing discussion (a report of this meeting appeared in *Smokeless Air*, Winter 1964).

During the summer a full programme of visits was arranged for members but unfortunately, due to lack of interest, some had to be cancelled. However, the following places proved sufficiently attractive to give parties of 20-30 members an interesting and enjoyable outing and the Division is most grateful to the bodies who provided facilities on these occasions:-

National Coal Board, Mechanized Fuel Depot, West Drayton.
North Thames Gas Board, Gas re-forming plant, Southall.
National Coal Board, Coal face at Baddesley Colliery, Atherstone.
National Coal Board Briquetting Plant ("Homefire"), Birch Coppice.

J. S. HODGINS, *Hon. Secretary*

Information About the Society

The forerunners of the Society were the Coal Smoke Abatement Society, established in London in 1899, the Smoke Abatement League of Great Britain (1909) concerned mainly with the Provinces, and the National Smoke Abatement Society, formed in 1929 by the amalgamation of the two parent organizations. At a Special General Meeting held in April 1957, it was agreed unanimously to change the name of the Society to "National Society for Clean Air", and to seek incorporation as a company limited by guarantee, a licence being sought from the Board of Trade to omit the word limited. The Society assumed its new name and status as from 1st January, 1958. For further information about membership, Executive Council and Committees, etc., reference should be made to the Society's Memorandum and Articles of Association and Byelaws.

Divisions

For electoral purposes and where it is desired, area organization, the Society is now composed of the following geographical Divisions: (1) Scotland, (2) Northern Ireland, (3) North West, (4) North East, (5) Yorkshire, (6) West Midlands, (7) East Midlands, (8) South West, (9) South East, (10) South Wales and Monmouthshire. (See Byelaws for the Counties in each Division).

Membership

The Society is wholly dependent on the contributions of its members for the growth and the maintenance of its work, and invites the support of all who sympathize with and wish to promote its objects. These are stated in full in the Memorandum of Association, but they may be briefly summarized as the securing throughout the

United Kingdom of the maximum of natural light and air free from every form of pollution, particularly that arising from the combustion of fuel. There are three main classes of membership—for individuals, local authorities, and corporate bodies such as firms, public undertakings and institutions. Individual members and the representatives of other members have rights of nomination and voting in elections for Officers and Council. They receive, free of charge, the Society's quarterly journal *Smokeless Air* and other publications. Local authority and corporate full members are also entitled to receive one *extra* copy of *Smokeless Air* and the Society's Year Book for each guinea by which their subscription exceeds three guineas. Corporate members who have branches or offices in Divisions of the Society other than that in which their Registered Office is situated may appoint Delegates to participate in the activities of those Divisions. Members are entitled to receive assistance and information on problems relating to air pollution. In addition to receiving notices of meetings and conferences organized nationally, they are entitled to participate in any activities organized by or within their Division.

Associates

Any individual, local authority, institution or corporate body contributing less than the appropriate membership subscription may become an *Associate*, entitled to some of the privileges of membership, but not to those relating to nomination, voting and election to office.

Subscriptions

INDIVIDUAL MEMBERS—Not less than £1 1s. 0d. a year.

LOCAL AUTHORITY MEMBERS—Not less than the following amounts, according to populations:

Less than 25,000	..	6 guineas
25,000 to 50,000	..	8 „
50,001 to 75,000	..	10 „
75,001 to 100,000	..	15 „
100,001 to 250,000	..	25 „
250,001 to 500,000	..	36 „
Over 500,000	..	48 „

CORPORATE MEMBERS (which includes Companies, Firms, and Departments of Local Authorities)—Not less than 25 guineas for members appointing two Representatives; not less than 15 guineas for members appointing one Representative.

(Under Article 5 (e) (ii) of the Society's Articles of Association, an Association or firm which is not incorporated can appoint representatives to act on its behalf, and obtain all the benefits of Corporate Membership.)

SUSTAINING MEMBERS—A Member in any class subscribing not less than £100 a year. (See list page 62).

SPECIAL CASES—The Executive Council may consider applications for membership on special terms as to subscriptions and otherwise. This rule is intended to apply in particular to local and other small voluntary associations wishing to become Corporate Members.

ASSOCIATES—Any sum that is less than the appropriate subscription for membership.

DONATIONS—The Society will be pleased to receive single or annual donations for any amounts from non-members.

PUBLICATIONS — Annual subscriptions may be made for *Smokeless Air* and for other publications as issued.

PAYMENT OF SUBSCRIPTIONS—The first subscription should be forwarded with application for membership. This may be sent at any time, and the subscription remains in force until the first day of the corresponding month of the following year. It is mutually advantageous if subscriptions are made by Banker's Order.

COVENANT DONATIONS—Annual contributions to the Society may be made under covenant, the Society being recognized as a "charity" by the Commissioners of Inland Revenue for this purpose. By signing an agreement to subscribe a stated sum for a period of at least seven years the Society may claim the amount of income tax that has been paid on such contributions, thereby increasing the benefit it receives without additional cost to the donor. Further particulars and form of covenant will be forwarded on request.

Representatives and Delegates

Local authority and Corporate Members are entitled to appoint Representatives to exercise on their behalf the rights of membership with regard to nomination for office, voting, receipt of publications, etc. Corporate Members may appoint one or two representatives each, according to subscription, and Local Authority Members a number according to population, as follows:

Less than 100,000	2
100,001 to 250,000	3
250,001 to 500,000	4
500,001 and over	5

Note: The Delegates mentioned previously participate in the activities of the Society *only* at Divisional level. A member's Representative exercises all the rights to which a member is entitled.

The names and addresses of Representatives should be forwarded on making application for membership, so that they may be entered in the Voting Registers.

Services to Members

Information and Advice

Advice, assistance and information on matters relating to atmospheric pollution and its prevention is available free of charge to Members, provided that, where necessary, the request is approved by the Executive Council. If the information required is not immediately available to the Society's Information Department, the Society is prepared, on behalf of a Member, to obtain it from one of the specialized Information Bureaux.

Library

The Society's Library is available for the use of all Members. It possesses classified files of Press cuttings, and an extensive collection of both British and foreign books, reports and pamphlets on air pollution and related subjects. In some cases, the Society is the only organization in the United Kingdom receiving the publication. Books and other publications are issued on loan, or may be consulted in the Society's offices. The Society is linked with various specialist and technical libraries, and when a publication relating to some special aspect of air pollution is not in the library, the Society can often borrow it through other sources. Applications should be made initially to the Librarian.

Lectures

The Society will be pleased to help members and others in any part of the country to arrange lectures and talks of all kinds on atmospheric pollution and related subjects. A panel of speakers, arranged regionally, is being prepared and will be supplied on request.

Slides

A library of 35 mm. transparencies covering all aspects of air pollution is in course of preparation. The slides will be available on loan. Details on request.

Films

The Society does not possess films or film strips for loan, but a comprehensive list of films available from other sources is given elsewhere in this Year Book.

Exhibitions

The Society is ready to consider participating in exhibitions, and has a supply of display material and portable exhibition units for loan. The range of material is quite large, and to help members select exhibits suitable for their requirements, an illustrated catalogue has been prepared, which will be sent to those interested, on request.

Demand for this material is heavy particularly in spring and autumn, and it is advisable that inquiries should be made as early as possible in advance.

No charge is made for the loan of the material other than the cost of carriage. In order to keep these carriage charges to the minimum, some of the larger units have been distributed to the following Divisions: Scottish, North East, North West, Yorkshire, East Midlands, West Midlands, and in addition two units are kept at headquarters. Full details can be obtained from the Hon. Secretaries of the respective Divisions or from the Exhibitions Officer.

Publicity Advisory Service

The Society's Publicity Advisory Service is available to help Local Authorities and Corporate Members with their Clean Air Publicity, especially when Smoke Control Orders are pending.

The Service advises members on display material, its arrangement for exhibitions, stands, etc., gives guidance on the general organization of exhibitions and advises and supplies information on other publicity activities such as public meetings, local press features and correspondence, educational work in schools, women's organizations, etc.

No charge is made for this service to members.

Exhibition Display Material

The Society has acquired a new exhibition display unit which will be available on loan to local authorities. Known as "Speedframe Display", it consists of metal tubes which can be built up into a number of different shaped free-standing displays, to which are attached 30 ins. x 24 ins. display panels. The first display now available consists of eight panels as follows:

Clean Air and Health
Clean Air and the Home
Clean Air and the Cost of Living
Clean Air and Industry
Clean Air and the Vehicle
Clean Air and the Future
and two plain coloured panels

The complete display measures 10 ft. x 2 ft. x 7 ft. and incorporates a 2 ft. x 2 ft. table for literature. It requires ten travelling cases to transport and will be sent by rail or road service vehicles.

In addition to the four information panels (catalogue reference I.P. 1 - I.P.4, new framed panels under perspex are now available: Details of all these panels will be sent on request.

"Do-It-Yourself" Display Kits

The provision of these kits to members will be of value to local authorities who are staging their own exhibitions. Each pack will consist of six display photographs, size 18 ins. x 15 ins. approximately, mounted on board, together with appropriate captions and headings, printed on card.

At present two different kits are available at a nominal charge of 10s. each.

DIY.1 *Six Reasons for Smoke Control.*
DIY.2 *Why Clean Air For Me?*—Answers to some of the arguments put forward by householders against smoke control.

Posters

The Society has a number of coloured and line posters available, ranging in price from 1s. 9d. per copy (double crown) to £7 10s. per 100 copies (with a reduction for Members). Crown line posters cost 8d. per copy to £2 8s. for 100 copies.

The full list of posters available is as follows:

No. 1. *Smoke Spells Danger*
No. 2. *Clean Air is Your Affair*
No. 3. *It's Better Up Here . . .*
No. 4. *Prevent Air Pollution—Britain's Biggest Headache*
No. 5. *Smokeless Zones—Cleaner Homes*
No. 6. *Away with Smoke—Let in the Light*
No. 7. *They Didn't Know What to do!* (*Crown size only*)
No. 8. *We Have the Answer to Smoke.* (*Crown size only*)
No. 9. *These are the Things that Smoke Does.*
Nos. 10 and 11 *For Clean Air*—Poster designed for local overprinting (Double Crown and Crown sizes available).

Literature

Inquiries are invited on the supply of publications, give-away leaflets, etc., for special purposes. Particulars of these are given below and also in the Society's "Guide to Publications", on another page.

(1) "Descriptive Summary of the Clean Air Act." 6d. per single copy (by post 8d.), 4s. 6d. per dozen, or £1 10s. per 100.
(2) "Facts About Smoke." 16s. per 100, or £6 10s. per 1,000.
(3) "They Didn't Know What to do." 4s. per 100, or £1 10s. per 1,000.
(4) "Clean Air Begins at Home". 15s. per 100, or £6 per 1,000.
(5) "Smoke Affects Your Health & Your Wealth." 15s. per 100, or £6 per 1,000.
(6) Clean Air Cheques.—The cost of air pollution, stated simply and concisely on an imitation cheque form. £2 10s. per 1,000.
(7) Clean Air Bookmarks—4s. per 100, 30s. per 1,000.
(8) Clean Air: Notes for Teachers and Lecturers. 1s. 6d. (1·10) per copy 15s. 6d. per dozen.

Photographs

The Society has a classified and indexed collection of smoke and other photographs, which are suitable for reproduction and/or exhibition purposes. Prints may be inspected at the Society's offices, or a selection will be sent by post if details of requirements are given. The copyright in the photographs is retained by the photographer, and where reproduction fees are chargeable, the inquirer should communicate with the photographer.

New photographs of high pictorial quality, with reproduction rights, are required, either as gifts or for payment at standard rates.

Wall Chart

For school use. 44 ins. x 25 ins. (2s. including Lecture Notes)

NATIONAL SOCIETY FOR CLEAN AIR

(Limited by Guarantee—Incorporated 1st January, 1958)

Balance Sheet as at 31st December, 1964

1963 £		£	s.	d.	£	s.	d.
	GENERAL FUND						
11,187	Balance as at January 1st, 1964 ..				14,611	11	6
2,872	*Add:* Surplus for the year				2,068	11	2
553	Legacy				—		
14,612					16,680	2	8
	PREMISES RESERVE FUND						
1,667	Balance as at January 1st, 1964 ..	2,666	19	4			
1,000	*Add:* Transfer from Income and Expenditure Account	1,000	0	0			
2,667					3,666	19	4
—	JOHN STANLEY SEVERS LEGACY FUND				5,187	6	4
17,279					25,534	8	4
	CURRENT LIABILITIES						
1,500	Sundry Creditors and Accrued Expenses				2,301	10	3
£18,779					£27,835	18	7

Stanley E. Cohen, *Honorary Treasurer*

Arnold Marsh, *Director and Secretary*

1963 £		£	s.	d.	£	s.	d.
	FIXED ASSETS						
	Office Equipment and Furniture				Not Valued		
	INVESTMENTS AT COST						
5,073	Government and Corporation Stocks	5,073	13	7			
2,096	Other Fixed Interest Stocks ..	5,041	4	7			
1,641	Ordinary Shares	3,646	10	5			
8,810					13,761	8	7
	(Market Values at: 31.12.63 £9,123 31.12.64 £13,188)						
	CURRENT ASSETS						
567	Stock of Posters, Charts, etc. at valuation	409	0	0			
1,245	Sundry Debtors and Prepayments ..	2,371	7	0			
	Balance at Bank:						
7,343	Deposit Account	10,371	9	3			
748	Current Account	854	14	7			
66	Cash in Hand	67	19	2			
9,969					14,074	10	0
£18,779					£27,835	18	7

Income and Expenditure Account for the year ended 31st December, 1964

1963 £	EXPENDITURE	£	s.	d.	£	s.	d.
9,281	Salaries and Wages				9,732	4	6
1,422	Staff Pension Scheme				1,441	18	1
2,040	Rent, Rates, Light and Heat				1,995	0	1
1,743	Travelling Insurance, Cleaning and General Expenses				1,861	3	4
237	Office Equipment and Furniture ..				183	4	0
472	Stationery and Supplies				552	10	9
3,689	*Smokeless Air* and Year Book Printing, Postage etc.	3,633	6	10			
2,958	*Less:* Receipts from Advertisements ..	3,059	4	1			
731					574	2	9
1,779	Information and Publicity Services and cost of Publications				1,845	15	0
540	Divisional Grants				585	0	0
18,245					18,770	18	6
	EXCESS OF INCOME OVER EXPENDITURE						
1,000	Transfer to Premises Fund	1,000	0	0			
2,872	Balance to General Fund	2,068	11	2			
3,872					3,068	11	2
£22,117					£21,839	9	8

1963 £	INCOME	£	s.	d.	£	s.	d.
14,137	Subscriptions and Donations				14,218	17	6
3,559	Conference Fees	4,152	6	3			
2,150	Less Expenses	3,394	4	7			
1,409					758	1	8
8,544	Exhibition Income	9,769	8	0			
3,790	*Less:* Expenses	4,915	15	1			
4,754					4,853	12	11
1,161	Sales of Publications				1,056	5	2
	INVESTMENT INCOME						
359	Taxed Dividends	456	19	10			
142	Income Tax Repayment	167	0	10			
155	Bank Deposit Interest	328	11	9			
656					952	12	5
£22,117					£21,839	9	8

REPORT OF THE HONORARY AUDITORS TO THE MEMBERS OF THE NATIONAL SOCIETY FOR CLEAN AIR

We have obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of the Audit. In our opinion proper books of account have been kept by the Society so far as appears from our examination of those books. We have examined the Balance Sheet and annexed Income and Expenditure Account which are in agreement with the books of account. In our opinion and to the best of our information and according to the explanations given to us the said accounts give the information required by the Companies Act, 1948, in the manner so required and the Balance Sheet gives a true and fair view of the state of the Society's affairs as at 31st December, 1964, and the Income and Expenditure account gives a true and fair view of the surplus for the year ended on that date.

GEO. LITTLE, SEBIRE & CO., *Chartered Accountants.*
Adelaide House, London Bridge, London, E.C.4. *Hon. Auditors.*

11th February, 1965

Subscriptions and Donations

January 1st to December 31st, 1964

* Denotes Covenant Donor

(2) denotes two Subscriptions received during the year

Scottish Division

	£	s.	d.
Aberdeen Corporation	26	5	0
Airdrie Corporation	8	8	0
Ardrossan Corporation	6	6	0
Ayr County Council	5	0	0
Ayr Corporation	3	3	0
*Barclay-Smith, Lt. Col. E. A.	1	1	0
Broadbent, J.	1	1	0
Clackmannan County Council	8	8	0
Clydebank Corporation	10	10	0
Coatbridge Corporation	10	10	0
Cooper, F. T.	1	1	0
Currie, T. S.	1	1	0
Dumbarton Corporation	6	6	0
Dumfries Corporation	8	8	0
Dunbarton County Council	26	5	0
Dundee Corporation	26	5	0
Dunfermline Corporation	8	8	0
East Kilbride Development Cpn.	7	7	0
Edinburgh Corporation	37	16	0
Falkirk Corporation	8	8	0
Federated Foundries Ltd.	3	3	0
Fife County Council	26	5	0
Francis, S. H.	1	1	0
Gibb, Dr. W.	1	1	0
Glasgow Corporation	50	8	0
Glasgow Tree Lovers' Society	1	1	0
Grangemouth Corporation	6	6	0
Grattidge, H. H. (2)	2	2	0
Hamilton Corporation	4	4	0
Hawick Corporation	6	6	0
Howden, James & Co. Ltd.	26	5	0
Hughs, H. S.	1	1	0
Hunter, R.	1	1	0
Inverness County Council	10	10	0
Inverness Corporation	8	8	0
Irvine Corporation	6	6	0
Johnstone Corporation	6	6	0
Kilsyth Corporation	6	6	0
Kirkcaldy Corporation	10	10	0
Kirkintilloch Corporation	6	6	0
Lanark County Council	37	16	0
Laurie, G. (2)		10	0
Motherwell & Wishaw Corporation	10	10	0
North of Scotland Hydro-Electric Board	15	15	0
Page, J.	1	1	0
Paisley Corporation	15	15	0
Park, W. Y.	2	2	0
Perth County Council	3	3	0
Perth Corporation	8	8	0
Renfrew County Council	12	12	0
Renfrew Corporation	6	6	0
*Renwick, Dr. and Mrs. J.	1	0	0
*Ritchie, G. B.	1	1	0
Rothesay Corporation	6	6	0
Royal Sanitary Asscn. of Scotland	15	15	0
Rutherglen Corporation	6	6	0
Scottish Gas Board	73	10	0
Scott Park, Dr. and Mrs. S. D.	1	1	0
Shankland, Mrs. R.		15	0
Slimming, D. W. (2)	2	10	0
Smith & Wellstood Ltd.	1	1	0
South of Scotland Elec. Board	50	0	0
Stirling County Council	26	5	0
Stirling Corporation	8	8	0
Strump, G.		10	6
Tucker, P.	1	1	0
Waldie, J. & Sons Ltd.	1	1	0
Wightman, Mrs. U. N.	1	1	0
Will, D. D.	1	1	0

Northern Ireland Division

	£	s.	d.
Antrim County Council	5	5	0
Ballymena Corporation	6	6	0
Belfast Corporation	37	16	0
Carey, Dr. G. C. R.	1	1	0
Carrickfergus Corporation (2)	12	12	0
Castlereagh, R.D.C.	8	8	0
Davidson & Co., Ltd.	15	15	0
Edwards, Dr. M. D.	1	1	0
Edwards, T. G.	1	1	0
*Ellison, C. A.	1	10	0
Guinness, Arthur Son & Co. (Belfast) Ltd.	15	15	0
Hood, N. R. J.	1	1	0
Jenkins, Major W.	1	1	0
Knox, Dr. E. W. (2)	2	2	0
Londonderry Corporation	10	10	0
Lynas, K. N.	1	10	0
McCutcheon, N.	1	1	0
Musgrave & Co., Ltd.	26	5	0
Northern Ireland Housing Trust	15	15	0
O'Brien, W. E. C.	1	1	0
Ormeau Bakery Ltd.	15	15	0
Peel, R.	1	1	0
Pemberton, Professor J.	1	1	0
Porter, Colonel H. J.	2	2	0
Reynolds, A.	1	10	0

North West Division

	£	s.	d.
Abram U.D.C.	6	6	0
Accrington Corporation	8	8	0
Affleck & Brown Ltd.	2	2	0
Aitkenhead, Miss M.	1	0	0
Altrincham Corporation	8	8	0
Amende, H. F.	1	0	0
Andrews, K.		12	6
Anonymous	20	0	0
Ashton Bros. & Co., Ltd.	2	2	0
Ashton-in-Makerfield U.D.C.	6	6	0
Ashton-under-Lyne Corpn.	10	10	0
Atherton U.D.C.	6	6	0
Audenshaw U.D.C.	6	6	0
Bacup Corporation	6	6	0
Barnes, Cllr. W.	1	1	0
Barrow-in-Furness Corpn.	10	10	0
Baxendale & Co., Ltd.	2	2	0
*Beard, E.	2	17	0
Beattie, E. & F. Ltd.	1	1	0
Bebington Corporation	10	10	0
Behrens, A.		10	0
Bibby, H. P.	2	0	0
Bibby, J. & Sons Ltd.	15	15	0
Birkenhead Corporation	2	2	0
Blackburn Corporation	26	5	0
Blackpool Corporation	26	5	0
Bolton Corporation	26	5	0

	£	s.	d.
Bootle Corporation	12	12	0
Bredbury & Romiley U.D.C.	6	6	0
Brierfield U.D.C.	6	6	0
British Insulated Callender's Cables Ltd.	15	15	0
*Brown, P. S.	1	1	0
Bury Corporation	10	10	0
Cass, H. V. (2)	2	2	0
Chadderton U.D.C.	8	8	0
Cheadle & Gatley U.D.C.	8	8	0
Cheshire County Council	50	8	0
Chester R.D.C.	8	8	0
Christian, F. V.	1	1	0
Church U.D.C.	6	6	0
Clarke, Mrs. M.	1	1	0
Clegg, E.	1	1	0
Clitheroe Corporation	3	3	0
Clusky, H.	1	1	0
Colne Corporation	6	6	0
Community Council of Lancashire	2	2	0
Connah's Quay U.D.C.	6	6	0
Cooper, Miss I.	1	1	0
Cotton, Cllr. S. A.	1	1	0
Coulthard, Miss D.	1	1	0
Crew Corporation	10	10	0
Crompton U.D.C.	6	6	0
Crosby Corporation	3	3	0
Cumberland County Council	5	0	0
Darwen Corporation	8	8	0
Denton U.D.C.	8	8	0
Droylsden U.D.C.	8	8	0
Duguid, S.	3	3	0
Duguid, Mrs. S. N.	1	1	0
Dukinfield Corporation	6	6	0
Eccles Corporation	8	8	0
Ellesmere Port Corporation	8	8	0
Failsworth U.D.C.	6	6	0
Fallows, W. B.	1	1	0
Farnworth Corporation	8	8	0
Farquharson, G. W.	1	1	0
Ferranti Ltd.	21	0	0
Fleetwood Corporation	8	8	0
Flint Corporation (2)	12	12	0
Franklin, E. J.	1	1	0
Franklin, N. J.	1	1	0
Fulwood U.D.C.	6	6	0
Furness District Federation of Owner-Occupiers' Asscns.	2	2	0
*Gavaghan, Mrs. L. A. (2)	2	2	0
Gee, J.	1	1	0
Glossop Corporation	6	6	0
Graham, Mrs. E. M.	1	1	0
*Graham, G. M.	1	0	0
Great Harwood U.D.C.	6	6	0
Hale U.D.C.	6	6	0
Hall, A.	1	10	0
Halliday, A. C.	1	10	0
Hallows, V. K.	1	1	0
Haslingden Corporation	6	6	0
Haworth, Miss M.	1	1	0
Haydock U.D.C.	6	6	0
*Hayhurst, H.	1	1	0
Hazel Grove & Bramhall U.D.C.	6	6	0
*Heald, Dr. G. E.	1	1	0
Hewitt, F.	1	1	0
Heywood Corporation	8	8	0
Hindley U.D.C.	6	6	0
Hindpool Central & Furness Owner-Occupiers' Asscn.	2	2	0
Hockton, D.	2	0	0
Horwich U.D.C.	6	6	0
Hoylake U.D.C.	5	5	0
Huyton-with-Roby U.D.C.	10	10	0
Hyde Corporation	8	8	0
Ince-in-Makerfield U.D.C.	6	6	0
Irlam U.D.C.	6	6	0
Jackson, C. L.	1	1	0
*Jackson, P. L.	1	1	0
Jewsbury, S.	1	1	0
Kearsley U.D.C.	6	6	0
*Keddie, Dr. J. T. Chalmers	1	1	0
Kirk, W. R.	1	1	0
Kirkby U.D.C.	10	10	0
Kitchener, The Rt. Hon. The Earl	1	0	0
Lancashire County Council	52	10	0
Lancashire & District Coke Distributors' Asscn.	26	5	0
Lancashire Corporation	8	8	0
Langford, A. S.		10	6
Lees, Miss M.	1	1	0
Leigh Corporation	8	8	0
Leyland U.D.C.	6	6	0
Littleborough U.D.C.	6	6	0
Liverpool Corporation	10	10	0
Longdendale U.D.C.	6	6	0
Macclesfield Corporation	8	8	0
*Macnair, A. S.	1	1	0
MacWilliam, Dr. H. H.		15	0
Manchester Corporation	50	8	0
Manchester & District Regional Clean Air Council	15	15	0
Marple U.D.C. (2)	12	12	0
*Mather, W. L.	1	15	0
Mather & Platt Ltd.	50	0	0
Matlock U.D.C.	6	6	0
Mersey & North Wales Elec. Board	39	0	0
Middleton Corporation	10	10	0
Middlewich U.D.C.	6	6	0
Mitchell, L. A.	1	1	0
Mold U.D.C.	6	6	0
Morecambe & Heysham Corpn.	8	8	0
Nantwich U.D.C.	6	6	0
Nelson Corporation	8	8	0
Northern Gas Board—			
Carlisle	1	11	6
Penrith		10	6
Workington	1	11	6
North Western Elec. Board	63	0	0
North Western Gas Board	105	0	0
Northwich R.D.C.	8	8	0
Northwich U.D.C.	6	6	0
*Norwood, Mrs. D. B.	1	1	0
Oldham Corporation	26	5	0
Ormskirk U.D.C.	6	6	0
Padiham U.D.C. (2)	12	12	0
Pike, Miss I. M.	1	1	0
Polding, W. W.		10	6
Preston Corporation	26	5	0
Preston R.D.C.	8	8	0
Prestwich Corporation	8	8	0
Radcliffe Corporation	8	8	0
Rae, Cllr. K. F.	1	1	0
Ramsbottom U.D.C.	6	6	0
Refuge Assurance Co., Ltd	12	12	0
Rhyl U.D.C.	6	6	0
Richards, J. E.	1	1	0
Rishton U.D.C.	2	2	0
Rochdale Corporation	15	15	0
Runcorn U.D.C.	8	8	0
St. Helens Corporation	26	5	0
Sale Corporation	8	8	0
Salford Corporation	26	5	0
*Scott, Mrs. A. O.	1	0	0
Shaw, Mrs. M.	1	1	0
Shaw, Mrs. R.		10	6
Simon-Carves Ltd. (2)	200	0	0
Skelmersdale U.D.C.	6	6	0
Smith. Cllr. Wm.	1	1	0
South-East Lancs. & North Cheshire Consultative Committee for the Investigation of Atmospheric Pollution	2	2	0
Southport Corporation	1	1	0
Stalybridge Corporation	6	6	0
Standish-with-Langtree U.D.C.	6	6	0
Stanyard, R. J.	1	1	0
Stockport Corporation	26	5	0
Stretford Corporation	10	10	0
Summers, John & Sons Ltd.	26	5	0
Swinton & Pendlebury Corpn.	8	8	0
Taylor, Mrs. E.	1	1	0
Taylor, S.	1	1	0

	£	s.	d.
Thomas, F. L.	1	1	0
Thornton Cleveleys U.D.C.	5	5	0
Thorpe, J. A.	1	1	0
Tillotsons Newspapers Ltd.	15	15	0
Tintwistle R.D.C.	2	2	0
Topham, Mrs. D. A.	1	1	0
Up Holland U.D.C.	6	6	0
*Vanstone, H. B.	1	16	0
Viney, N. H.	1	1	0
Wallasey Corporation	26	5	0
Warrington Corporation (2)	31	10	0
Warrington Local Medical Cttee.	2	2	0
Warrington R.D.C.	2	2	0
West Lancashire R.D.C.	1	1	0
Whitefield U.D.C.	6	6	0
Whitworth U.D.C.	6	6	0
Widnes Corporation	10	10	0
Wigan Corporation	15	15	0
*Williams, W. B.	1	0	0
Williamson, J. G.		15	0
Wilmslow U.D.C.	6	6	0
Winsford U.D.C.	8	8	0
Workington Corporation	8	8	0
Worsley U.D.C.	8	8	0
Wrexham R.D.C.	10	10	0

North East Division

	£	s.	d.
Allott, S.		15	0
*Angus, Colonel E. G.	3	3	0
Ashington U.D.C.	8	8	0
*Atkinson, E.		15	0
Atkinson, H.		15	0
Bedlingtonshire U.D.C.	8	8	0
Billingham U.D.C.	6	6	0
Bird, D.	1	1	0
Blaydon U.D.C.	8	8	0
Bradley, R. M.	1	1	0
Brandon & Byshottles U.D.C.	6	6	0
Bulcock, The Reverend K.	2	0	0
Carr, W.	1	1	0
Castle Ward R.D.C.	6	6	0
Chester-le-Street R.D.C.	8	8	0
Chester-le-Street U.D.C.	6	6	0
Consett U.D.C.	8	8	0
Crook & Willington U.D.C.	8	8	0
Dorman, Long & Co., Ltd.	15	15	0
Durham R.D.C. (2)	16	16	0
Eston U.D.C.	8	8	0
Fletcher, D. R.	1	1	0
Gateshead Corporation	26	5	0
Gosforth U.D.C.	6	6	0
Hartlepool Corporation	6	6	0
Head Wrightson Iron & Steel Works Eng. Ltd.	26	5	0
Hebburn U.D.C.	6	6	0
Hetton U.D.C.	6	6	0
Houghton-le-Spring U.D.C. (2)	16	16	0
Imperial Chemical Industries Ltd. (Billingham Division)	15	15	0
*Isaac, Professor P. C. G.	1	1	0
Jarrow Corporation	8	8	0
Lanchester R.D.C.	6	6	0
Longbenton U.D.C. (2)	16	16	0
Middlesbrough Corporation	26	5	0
Newburn U.D.C.	8	8	0
Newcastle-upon-Tyne Corpn.	37	16	0
Newcastle Regional Hospital Board	15	15	0
North Eastern Elec. Board	34	0	0
Northern Coke Distributors' Asscn.	15	15	0
Northern Gas Board—			
Blyth	1	1	0
Darlington	3	3	0
Hexham		10	6
Middlesbrough	4	4	0
Newcastle-upon-Tyne	21	0	0
Stockton-on-Tees	4	4	0
Sunderland	4	4	0
Northumberland County Council	37	16	0
Orchard, G. W.	1	1	0

	£	s.	d.
Redcar Corporation	8	8	0
Ryton U.D.C.	6	6	0
Saltburn & Marske-by-the-Sea U.D.C.	6	6	0
Seaham U.D.C. (2)	16	16	0
Sedgefield R.D.C.	8	8	0
Shildon U.D.C.	6	6	0
Skelton & Brotton U.D.C.	6	6	0
Smith, R. D.	1	1	0
South Shields Corporation	26	5	0
*Spriggs, Dr. E. A.	1	1	0
Stanley (Co. Durham) U.D.C.	8	8	0
Stockton-on-Tees Corporation	5	5	0
Sunderland Corporation	26	5	0
Sunderland R.D.C.	8	8	0
Tate, G. W.	1	1	0
Thornaby-on-Tees Corporation	6	6	0
Tynemouth Corporation	10	10	0
Wallsend Corporation	8	8	0
Washington U.D.C.	6	6	0
Watson, W. P.	1	1	0
West Hartlepool Corporation	15	15	0
Whickham U.D.C.	6	6	0
Whitley Bay Corporation	8	8	0

Yorkshire Division

	£	s.	d.
Aireborough U.D.C.	8	8	0
Allingham, J. C.	1	1	0
Barnsley District Coking Co., Ltd.	15	15	0
Batley Corporation	8	8	0
Bentley-with-Arksey U.D.C.	6	6	0
Bingley U.D.C.	6	6	0
Boyd, Miss A. D.	1	1	0
Bradford Civic Society	3	3	0
Bridlington Corporation	8	8	0
Brighouse Corporation	8	8	0
Brown, G. L.	2	2	0
Burn, Dr. A. Telford	1	1	0
Castleford Corporation (2)	16	16	0
Clayton, Son & Co., Ltd.	2	2	0
Coe. E,	1	1	0
Coke Oven Managers' Asscn. (2)	10	10	0
Colne Valley U.D.C.	6	6	0
Cudworth U.D.C.	6	6	0
Darton U.D.C.	6	6	0
Dearne U.D.C.	6	6	0
Denby Dale U.D.C.	6	6	0
Dewsbury Corporation	10	10	0
Doncaster Corporation	15	15	0
Doncaster R.D.C.	10	10	0
Elland U.D.C.	6	6	0
Etherington, H.	1	1	0
Gifford, Dr. P. W. W.	1	1	0
Goodfellow, J.	1	1	0
Green, E. & Son Ltd. (2)	50	0	0
Grunwald, Dr. H.	1	1	0
Hackney, E. S.	1	1	0
Hall, J. A. (2)	2	2	0
Hargreaves Group Ltd.	15	15	0
Harrogate Corporation	10	10	0
Heckmandwike U.D.C.	6	6	0
Hemsworth R.D.C.	10	10	0
Hemsworth U.D.C.	6	6	0
Hepton R.D.C.	6	6	0
Holdsworth, R. Y.	1	1	0
Holmes, W. C. & Co., Ltd.	26	5	0
Holmes, W. G.	2	10	0
Horbury U.D.C.	6	6	0
Horsforth U.D.C.	6	6	0
Hoyland Nether U.D.C.	6	6	0
Huddersfield Corporation	26	5	0
Ilkley U.D.C.	6	6	0
Jenkins, The Reverend P. W.	1	1	0
Jervis, Dr. J. Johnstone	1	1	0
Jones, L.	1	1	0
Jordan, H. H.	1	1	0
Keighley Corporation	2	2	0
Kingston-upon-Hull Corporation	37	16	0

	£	s.	d.
Knottingley U.D.C.	6	6	0
Law, J.	1	1	0
Leeds Corporation	50	8	0
Lewis, P. D.	1	1	0
*Marshall, G. C.	1	15	0
McLintock, Dr. S. W.	1	1	0
Meltham U.D.C.	6	6	0
Middlebrook, C. J.	1	1	0
Mirfield U.D.C.	6	6	0
Moore, L.		15	0
Morley Corporation	8	8	0
Normanton U.D.C.	6	6	0
North Eastern Coke Distributors' Asscn.	15	15	0
North Eastern Gas Board	50	8	0
North Riding of Yorkshire County Council	37	16	0
Nu-Swift International Ltd	50	0	0
Ossett Corporation	6	6	0
Otley U.D.C.	6	6	0
Park Gate Iron & Steel Co., Ltd,	26	5	0
Pudsey Corporation	8	8	0
Queensbury & Shelf U.D.C.	6	6	0
Rawmarsh U.D.C.	6	6	0
Rotherham Corporation	15	15	0
Rothwell U.D.C.	8	8	0
Royston U.D.C.	6	6	0
Rushton, J. L.	1	1	0
Scarborough Corporation	2	2	0
Scargill, M.	1	1	0
Sharp, A. I.	1	1	0
Sheffield & District Clean Air committee	50	8	0
Shipley U.D.C.	8	8	0
Skinningrove Iron Co., Ltd.	10	0	0
Skipton U.D.C.	6	6	0
Sowerby Bridge U.D.C.	6	6	0
Spenborough Corporation	8	8	0
Stanley (Yorks.) U.D.C.	6	6	0
Steam Storage Co., Ltd.	1	1	0
Swinton U.D.C.	6	6	0
Tuckley, Miss B.E.	1	1	0
*Underwood, Dr. G.	1	1	0
United Steel Companies Ltd.	50	0	0
Universal Machinery & Services Ltd.	15	15	0
Wakefield Corporation	10	10	0
Wakefield R.D.C.	6	6	0
Warwick, H. (2)	2	2	0
Wath-upon-Dearne U.D.C.	6	6	0
Weaving, J. M.	1	1	0
West Riding Clean Air Advisory Council	5	5	0
Wilson, H.	1	1	0
Wombwell U.D.C.	6	6	0
Wood, F. T.	1	1	0
Worsbrough U.D.C.	6	6	0
Wortley R.D.C.	8	8	0
York Corporation	5	5	0
Yorkshire Electricity Board	64	0	0

West Midlands Division

	£	s.	d.
Aldridge U.D.C.	10	10	0
Bedworth U.D.C.	8	8	0
Best, J. K.	1	1	0
Bilston Corporation	8	8	0
Birmingham Corporation	58	16	0
Brierley Hill U.D.C.	10	10	0
Brooke, J. R.	1	1	0
Brownhills U.D.C.	6	6	0
Burton-upon-Trent Corporation	10	10	0
Cadbury Bros. Ltd.	15	15	0
Cannock R.D.C.	8	8	0
Cannock U.D.C.	8	8	0
Comley, A. & Wall Ltd.	1	1	0
Cosley U.D.C.	8	8	0
Coventry Corporation	37	16	0
Cradley Boiler Co., Ltd.	15	15	0
Danks, E. & Co. (Oldbury) Ltd.	26	5	0
Darlaston U.D.C.	6	6	0
Dickinson, S.	1	1	0
Dingley, Alderman W. L.	1	1	0
Donaldson, I. J.	1	1	0
Dudley Corporation	10	10	0
Fletcher, J. P.	1	5	0
Frost, H. & Co., Ltd.	2	2	0
Garner, N. A.	1	1	0
Gibbons Bros. Ltd.	25	0	0
Gibbons, E. B.	10	0	0
Gillett, Mr. & Mrs. J. A.	2	2	0
Gimson, J. & Co., Ltd.	15	15	0
Grimmett, P. H. G. (2)	2	2	0
Guest, Keen & Nettlefolds Ltd.	50	0	0
Halesowen Corporation	8	8	0
Hereford Corporation	8	8	0
Kay, W. L.	1	1	0
Kidderminster Corporation	8	8	0
Leamington Spa Corporation (2)	16	16	0
Lichfield R.D.C.	8	8	0
Longley, J. C.	1	1	0
Machen, C.	1	1	0
Martine, Dr. W. R.	1	1	0
Meriden R.D.C.	10	10	0
Midland Counties Coke Distributors' Asscn.	15	15	0
Midlands Electricity Board	65	0	0
Midlands Joint Advisory Clean Air Council	10	10	0
Newcastle-under-Lyme Corporation	10	10	0
Nuneaton Corporation	10	10	0
Oldbury Corporation	10	10	0
Owen, A. G.	1	1	0
Pringle, Dr. J. E.	1	1	0
*Pringle, E.	1	1	0
Radiant-Heating Ltd.	5	5	0
Redditch U.D.C.	8	8	0
*Reynolds, K.	3	0	0
Rowley Regis Corporation	8	8	0
Rugby Corporation	8	8	0
Rugeley U.D.C.	6	6	0
Sedgley U.D.C.	6	6	0
Smart, R. C.		10	6
Smethwick Corporation	10	10	0
Smith, S. A.	1	1	0
Solihull Corporation	15	15	0
Stafford Corporation	8	8	0
Staffordshire County Council	50	8	0
Steadman, A. T.	1	1	0
Stoke-on-Trent Corporation	37	16	0
Stone R.D.C.	6	6	0
Stone U.D.C.	6	6	0
Taylor, Mr. & Mrs. C. B.	2	2	0
Tipton Corporation	8	8	0
Walsall Corporation	26	5	0
Waltho, R. B.	1	1	0
Ward, Mrs. M. G.	1	1	0
Warwick Corporation	6	6	0
Warwick R.D.C.	8	8	0
Warwickshire County Council	18	18	0
Wednesbury Corporation	8	8	0
Wednesfield U.D.C.	6	6	0
Wellington (Salop)	3	3	0
West Bromwich Corporation	15	15	0
West Midlands Gas Board	105	0	0
Willenhall U.D.C.	26	5	0
Wolverhampton Corporation	26	5	0
Worcester Corporation	10	10	0
Wright, J.	1	10	0

East Midlands Division

	£	s.	d.
Alfreton U.D.C.	6	6	0
Allison, G.	2	2	0
Ballard, W. A.	1	1	0
Basford R.D.C.	10	10	0
Beeston & Stapleford U.D.C.	10	10	0
Bolsover U.D.C.	6	6	0
Boston Corporation	6	6	0
*Brown, J. A.	1	1	0
Cambridge Corporation	1	1	0
Carlton U.D.C.	8	8	0

	£	s.	d.
Carpenter, The Reverend V. A.		10	6
Chesterfield Corporation	10	10	0
Chesterfield R.D.C.	15	15	0
Clarke, N.	1	1	0
Clay Cross U.D.C.	6	6	0
Clowne R.D.C.	6	6	0
Coalite & Chemical Products Ltd.	300	0	0
Coalville U.D.C.	8	8	0
Cooper, Alderman S.	1	1	0
Corby U.D.C.	8	8	0
Crowther, Dr. J. S.	1	1	0
Davies, Dr. D.	1	1	0
Dearden, Mr. and Mrs. J.	3	0	0
Derby Corporation	26	5	0
Dronfield U.D.C.	6	6	0
Eales, C. D.	1	1	0
Eastern Electricity Board	66	0	0
East Midlands Elec. Board	51	0	0
East Midlands Gas Board	73	10	0
Eastwood U.D.C.	6	6	0
Fleming, I.	1	1	0
Ford, G. E.	1	0	0
Gainsborough U.D.C.	6	6	0
Glanford Brigg R.D.C. (2)	16	16	0
Grantham Corporation	8	8	0
Great Yarmouth Corporation	10	10	0
Grimsby Corporation	15	15	0
Gurney, J.	5	5	0
Harper, Dr. R. (2)	2	2	0
Hiller, G. A.	1	1	0
Hinckley U.D.C.	8	8	0
Ilkeston Corporation	8	8	0
Ipswich Corporation	26	5	0
Irthlingborough U.D.C.	6	6	0
Kettering Corporation	8	8	0
King's Lynn Corporation	8	8	0
Kirkby-in-Ashfield U.D.C.	6	6	0
Leicester Corporation	37	16	0
Lewis, Mrs. A. B.	1	1	0
Lincoln Corporation	10	10	0
Long Eaton U.D.C.	8	8	0
Loughborough Corporation	8	8	0
Lowestoft Corporation	8	8	0
Low Temperature Coal Distillers Asscn.	15	15	0
Mansfield Corporation	10	10	0
Mansfield Woodhouse U.D.C.	6	6	0
McDonald, J. D.	1	1	0
Newark Corporation (2)	12	12	0
Norwich Corporation	26	5	0
Nottingham Corporation	37	16	0
Nottinghamshire County Council	10	10	0
Old Fletton U.D.C.	6	6	0
Peterborough Corporation	10	10	0
*Pleister, Miss E. M. J.	1	1	0
Repton R.D.C.	2	2	0
Ripley U.D.C.	6	6	0
Rushden U.D.C.	6	6	0
Scopes, F. V.	1	1	0
Scunthorpe Corporation	10	10	0
Southwell R.D.C.	8	8	0
Staveley U.D.C.	6	6	0
Stewarts & Lloyds Ltd.	50	0	0
Sutton-in-Ashfield U.D.C.	8	8	0
Swadlincote U.D.C.	6	6	0
Turner, Miss H. E. (2)	4	0	0
*Turner, T. Henry	2	0	0
Wade, A.	1	1	0
Waring, F. L.	3	13	6
Warsop U.D.C.	6	6	0
Weldon, Miss G. M.	2	2	0
Wellingborough U.D.C.	3	3	0
West Bridgford U.D.C.	8	8	0
Whitelegg, C. J.	1	1	0
Wilkinson, J. R.	1	10	0
Williams, E. V. H.	1	1	0
Wisbech Corporation	6	6	0
Woodcock, F. Huntly	1	1	0
Worksop Corporation	8	8	0
Worksop R.D.C.	6	6	0
Wright, P. F.		15	0

South West Division

	£	s.	d.
Bath Corporation	15	15	0
Blampied, F.C.	1	1	0
Bristol Corporation	37	16	0
Bristol & West Clean Air Committee	5	5	0
Cawley, Lady	3	0	0
Cheltenham Corporation	10	10	0
Chudley, J. C.	2	2	0
Colehan, J. E.	1	1	0
Cox, T. L.	1	1	0
Crook, S. C.	1	1	0
Draper, P. (2)	2	2	0
Dursley R.D.C.	6	6	0
Gloucester Corporation	10	10	0
Harris, J.	1	1	0
Imperial Tobacco Company (of G.B. & Ireland) Ltd.	26	5	0
Kingswood U.D.C.	8	8	0
Poole Corporation	2	2	0
Porter, H. M.	1	1	0
Redston, P. V.	1	1	0
*Rogers, P.	2	2	0
Sodbury R.D.C.	4	4	0
South Western Electricity Board	26	0	0
South Western Gas Board	36	15	0
Stroud U.D.C.	6	6	0
Symonds, A. A.	1	1	0
Tewkesbury Corporation	2	2	0
Thornbury R.D.C.	8	8	0
Trevillion, Mrs. F. (2)	2	2	0
Weston-super-Mare Corporation	2	2	0
West Penwith R.D.C.	6	6	0
Weymouth & Melcombe Regis Corporation	8	8	0
Whiting, G. C.	2	2	0

South East Division

	£	s.	d.
Acton Corporation	10	10	0
Acworth, Miss E. A.	1	1	0
Acworth, Miss W. B.	5	5	0
Akenhead, A. (2)	2	2	0
Allied Ironfounders Ltd.	26	5	0
*Alston, Dr. J. M.	1	1	0
Ambuco Ltd.	15	15	0
Amersham R.D.C.	8	8	0
Armstrong, F. W.	1	0	0
Association of Public Health Inspectors	15	15	0
Atkinson, Mrs. M.	1	0	0
Ault, H.	1	1	0
Aylesbury Corporation	8	8	0
Bailey, H. D.	1	1	0
Baird, D. E.	1	1	0
Barash, Dr. M.	1	1	0
Barber, S. S.	1	1	0
Barking Corporation	10	10	0
Barnes Corporation	8	8	0
Basildon U.D.C.	15	15	0
Bastable, N.	1	1	0
Battersea Corporation	26	5	0
Bearman, Mrs. E.	1	1	0
Beckenham Corporation	5	5	0
Beddington & Wallington Corporation	8	8	0
Bedford Corporation	10	10	0
Bedfordshire County Council	37	16	0
Bethnal Green Corporation	8	8	0
Bexley Corporation	15	15	0
Bishop's Stortford U.D.C.	6	6	0
Bligh, Mrs. M. F.	1	1	0
Bognor Regis U.D.C.	2	2	0
Bonnell, Dr. J. A.	1	1	0
Booth, G. M.	2	2	0
Bottom, D. W.	1	1	0
Boult, Sir Adrian C.	1	1	0
*Boult, Miss O.	3	3	0
Bournemouth Corporation	2	2	0
Boyd, Miss D.	1	1	0
Braintree R.D.C.	6	6	0

	£	s.	d.
Brennan, Dr. J. J.	1	1	0
Brentford & Chiswick Corporation	13	10	0
Brighton Corporation	26	5	0
British Electrical Development Asscn.	250	0	0
British Iron & Steel Federation	350	0	0
British Medical Association	26	5	0
British Petroleum Co., Ltd.	100	0	0
British Railways Board	100	0	0
Bromley Corporation	10	10	0
Brooks, J. F.	1	1	0
*Brown, A. W.	1	1	0
Browne, Dr. D. Warren	1	1	0
Buckle, G. H. & Partners	26	5	0
Buist, Commander C.	10	10	0
Bullingdon R.D.C.	8	8	0
Burke, Dr. S. A.	1	11	6
Burland, Miss M. J.	1	1	0
Bushey U.D.C.	6	6	0
Butler, J. W.	2	2	0
Caller, Dr. S.		10	6
Camberwell Corporation	26	5	0
Capes, F. B.		15	0
Card, H. T.	1	1	0
Carshalton U.D.C.	10	10	0
Carter, Dr. J. S.	3	3	0
Catterall, Dr. Mary	2	2	0
Cave, Miss R.	1	1	0
Central Elecrticity Generating Board	300	0	0
Chamuffin, R. C.	1	1	0
*Chantler, P.	4	4	0
Chatfield, A. J.	1	1	0
Chelsea Corporation	8	8	0
Chemical Construction (Gt. Britain) Ltd. (2)	31	10	0
Cheshunt U.D.C.	8	8	0
Chigwell U.D.C. (2)	21	0	0
Chislehurst & Sidcup U.D.C.	15	15	0
*Chivers, D. P.		15	0
Clacton U.D.C.	3	3	0
Clarke, Dr. R. T. V.	1	10	0
*Clarke, S. H.	1	0	0
*Clinch, H. G.	1	1	0
Coal Utilisation Council	26	5	0
Collectron Ltd.	15	15	0
College of Fuel Technology	15	15	0
Coulsdon & Purley U.D.C.	1	1	0
Coutier, G. B.	1	5	0
Cousin, Lt. Col. A. J.	1	1	0
Crawley U.D.C.	8	8	0
Croydon Corporation	10	10	0
Dagenham Corporation	26	5	0
*Damon, W. A.	1	1	0
Dartford Corporation	8	8	0
Davies, P. M.	1	1	0
Deptford Corporation	10	10	0
Dobson, P. F.	1	0	0
Dray, F.	1	1	0
Drummond Dust & Fume Extractors Ltd.	15	15	0
Dunedin Engineering Co., Ltd.	15	15	0
Dust Suppression Ltd.	15	15	0
Ealing Corporation	26	5	0
*East, R. G.	1	1	0
East Barnett U.D.C.	10	10	0
Eastbourne Corporation	10	10	0
Eastern Gas Board	42	0	0
Eastleigh Corporation	8	8	0
*Eaton, Dr. F. J.	3	10	0
Ebben, G.	1	1	0
Edmonton Corporation	15	15	0
Egham U.D.C.	8	8	0
Electrical Asscn. for Women	26	5	0
Electricity Council	300	0	0
Elliott, Mrs. M. E.	1	1	0
Elstree R.D.C.	6	6	0
*Elsworthy, J. G.	2	2	0
Enfield Corporation	26	5	0
Epsom & Ewell Corporation	10	10	0
Erith Corporation	8	8	0
Esher U.D.C.	10	10	0
Essex County Council	3	3	0

	£	s.	d.
Esso Petroleum Co., Ltd.	150	0	0
Eton R.D.C.	10	10	0
Farnborough U.D.C.	2	2	0
Federation of British Cremation Authorities	2	2	0
Fell, N. F.	1	1	0
Finchley Corporation	10	10	0
Finsbury Corporation	8	8	0
Ford Motor Co., Ltd.	26	5	0
Fox, Dr. R. H.	1	1	0
Franklin, C. Ltd.	2	2	0
Friern Barnet U.D.C.	8	8	0
Fulham Corporation	26	5	0
*Gandy, H. (2)	3	0	0
*Gandy, Miss R. L.	2	2	0
Gardiner, P. C.	1	1	0
Garner, A. S.	1	1	0
Gas Council	250	0	0
Gibson, R. V.	1	1	0
Gillingham Corporation	10	10	0
*Gillison, Dr. J. A.	2	2	0
Gilpin, A.	1	1	0
Goodeve, Sir C. F.	2	2	0
Gosport Corporation	1	1	0
Graves, T. G.	1	1	0
*Green, J.	1	1	0
Greenwich Corporation	3	3	0
Greenwood, Mrs. E. L.	1	1	0
Greenwood, T. A. S.		15	0
Gresham House Estate Co., Ltd (2)	31	10	0
Griffel, Dr. W.		10	6
Guildford Corporation	10	10	0
Guildford R.D.C.	10	10	0
Guinness, A. Son & Co., (Park Royal) Ltd.	25	0	0
Gummer, R. H.	1	1	0
Hackney Corporation	26	5	0
Hales, J. S.	2	2	0
Halstead, V.	1	1	0
Hammersmith Corporation	26	5	0
Hampstead Corporation	15	15	0
Harlow U.D.C.	8	8	0
Harris Engineering Co., Ltd.	21	0	0
Harrold Leather Mfg. Co. Ltd.,	1	1	0
Harrow Corporation	26	5	0
Hastings Corporation	10	10	0
Havant & Waterloo U.D.C.	8	8	0
Hayes & Harlington U.D.C.	10	10	0
Hayward, E.	5	0	0
Hemel Hempstead Corporation	8	8	0
Hendon Corporation	26	5	0
Heston & Isleworth Corporation	26	5	0
Hickman, Miss V.	1	1	0
High Wycombe Corporation	8	8	0
*Hillier, Miss E. I.	1	1	0
Hitchin U.D.C.	6	6	0
Hoddesdon U.D.C.	6	6	0
Holborn Corporation	6	6	0
Holiday Fellowship Ltd.	2	2	0
Holmwood, Miss J.	1	1	0
Hornchurch U.D.C.	26	5	0
Hornsey Corporation	15	15	0
Horsham U.D.C.	6	6	0
Hove Corporation	10	10	0
Hulme, G. H.	1	5	0
Hussey, R.	1	1	0
*Hutton, Dr. K. B.	10	0	0
Ilford Corporation	26	5	0
Imperial Chemical Industries Ltd.	100	0	0
Institute of Fuel	26	5	0
Institution of Gas Engineers	15	15	0
International Combustion (Holdings) Ltd.	21	0	0
International Nickel Company (Mond) Ltd	15	15	0
*Irving, Miss R.	1	0	0
*James, B. W.	1	0	0
Jellis, F.	1	1	0
Kensington Corporation	3	3	0
Kent County Council	5	5	0
Kingston-upon-Thames Corporation	8	8	0

	£	s.	d.
night, H.	1	1	0
ambeth Corporation	26	5	0
angwell, W. H.	1	0	0
aundon, J. R.	1	1	0
eagrave Press Ltd.	15	15	0
eatherhead U.D.C.	2	2	0
Lee, Sir Kenneth	1	0	0
Lee, S. A.	1	5	0
Lessing, Dr. R.	2	2	0
eveson Gower, Miss V.	1	0	0
ewin, J. Upton	1	1	0
ewisham Corporation	26	5	0
ister, B. S.	2	0	0
ittlehampton U.D.C.	1	11	6
ondon (City) Corporation of ..	50	8	0
ondon & Counties Coke Distributors' Asscn.	15	15	0
ondon County Council	50	8	0
ondon Electricity Board	61	0	0
ondon & Home Counties Clean Air Advisory Council	15	15	0
ondon Trades Council	2	0	0
ondon Transport Board	26	5	0
uton Corporation	2	2	0
Madelin, Sqn. Ldr. I.		15	0
aidenhead Corporation	8	8	0
alden & Coombe Corporation ..	8	8	0
ann, A. C.	1	1	0
ason, J. K.	1	1	0
ather, L. E.	2	2	0
atthews, Dr. N. E.	1	1	0
edawar, Mrs. J. S.	1	0	0
elland, B.	1	10	0
enuhin, Yehudi	1	1	0
erton & Morden U.D.C.	10	10	0
iller, J. A.	1	1	0
etal Box Co., Ltd.	15	15	0
itcham Corporation	2	2	0
obil Oil Co., Ltd.	26	5	0
onkhouse, Dr. A. C.	1	1	0
oreland, S.	1	1	0
unicipal Passenger Transport Asscn. (Inc.)	15	15	0
ational Carbonizing Co., Ltd. ..	26	5	0
ational Coal Board	1,000	0	0
ational Federation of Coke Distributors' Asscns.	26	5	0
ew Forest R.D.C.	10	10	0
onhebel, Dr. G.	1	1	0
orthfleet U.D.C.	6	6	0
orth Thames Gas Board	105	0	0
rpington U.D.C.	10	10	0
xford Corporation	26	5	0
almer, J. C.	1	1	0
arker, Dr. A..	5	5	0
arker, H. (2)	2	2	0
arkinson, A. C. (2)	2	2	0
arry, M.		15	0
edler, T. W.	1	1	0
edrick, F.	1	1	0
enge U.D.C.	8	8	0
ennington, W. J.	1	1	0
etrofina (Gt. Britain) Ltd. ..	26	5	0
onting, Cllr. J.	1	1	0
oole. Mrs, W. M.	1	1	0
oplar Corporation	10	10	0
ortsmouth Corporation	10	10	0
otter, Dr. N. M.	1	1	0
owell Duffryn Heating Ltd. ..	15	15	0
eston, Dr. T. W.	1	1	0
ublic Transport Association ..	21	0	0
adiation Ltd.	31	10	0
adiovisor Parent Ltd.	21	0	0
eading Corporation	5	5	0
eigate Corporation	1	1	0
Richardson, R. L.	4	0	0
chmond Corporation	8	8	0
ckett Cockerell & Co., Ltd. ..	7	7	0
ckmansworth U.D.C.	8	8	0
Robinson, Mrs. E.	2	2	0
ochester, Corporation	8	9	0

	£	s.	d.
Rogers, Miss J. Scott	1	0	0
Romford Corporation	26	5	0
Roper, R.		10	6
Rosling, Miss E. M.	1	1	0
Royal Society of Health	15	15	0
Rundle, L. G. (2)	1	10	0
St. Marylebone Corporation.. ..	10	10	0
St. Pancras Corporation	5	5	0
Sansum, Mrs. E. B. (2)	2	2	0
Scorer, Professor R. S.	1	1	0
Shackcloth, W. (2)	2	2	0
Shanks, E. C.		15	0
Shaw Scott, G. (2)	2	2	0
Shell-Mex & B.P. Ltd.	150	0	0
Shoreditch Corporation	8	8	0
Sittingbourne & Milton U.D.C. ..	6	6	0
Slough Corporation	10	10	0
Smith, A. R.	5	5	0
Smith, D. V. H.	2	2	0
Smith, Mrs. P.	1	1	0
Society of Medical Officers of Health	15	15	0
Solid Smokeless Fuels Fedn. ..	52	10	0
Southampton Corporation	1	1	0
South Eastern Elec. Board	52	0	0
South Eastern Gas Board	105	0	0
Southend-on-Sea Corporation ..	2	2	0
Southern Electricity Board ..	56	0	0
Southern Gas Board	36	15	0
Southgate Corporation	2	2	0
Southwark Corporation	15	15	0
Southwick U.D.C.	6	6	0
Sowby, Dr. F. D.	1	1	0
Staines U.D.C.	8	8	0
Stansfield, A. F.	1	1	0
Stepney Corporation	15	15	0
Stewart, R. E..	1	5	0
Stoddard, Dr. A.	2	0	0
Stoke Newington Corporation ..	8	8	0
Strood R.D.C.	6	6	0
Stubbs, G. C.	1	1	0
Sturtevant Eng. Co., Ltd.	2	2	0
Sugg, Wm. & Co., Ltd.	2	2	0
Sullivan, J. S.	1	1	0
Sutherland, J. W.	1	1	0
Sutherland, K. W.	1	0	0
Sutton & Cheam Corporation ..	15	15	0
Swift, S.	1	1	0
Taylor, C. P. (2)	2	2	0
Thurrock U.D.C.	26	5	0
Tiranti, A.		6	0
Todd, G. F.	2	2	0
Toussaint, Dr. C. H. C.	1	1	0
Trianco Ltd. (2)	31	10	0
Triggs, Mrs. A.	1	1	0
Trist, R. & Co., Ltd.	31	10	0
Tunbridge Wells Corporation ..	1	1	0
Turner, Dr. W. C.	1	0	0
Twickenham Corporation	26	5	0
Vine, Mr. and Mrs. G. M.	2	2	0
Des Voeux, Mrs. M. F.	5	5	0
Waddell, A.		15	0
Walthamstow Corporation	3	3	0
Wandsworth Corporation	37	16	0
Wanstead & Woodford Corporation	10	10	0
Watford Corporation	10	10	0
Watford R.D.C.	10	10	0
Watson, Professor H. E.	2	0	0
Wembley Corporation	26	5	0
Wermann, J. C.	1	1	0
*White Drummond & Co., Ltd. ..	3	3	0
White, Dr. H. D. J.	1	0	0
Wigan, H. N. (2)	2	2	0
Willesden Corporation	26	5	0
Willison, Mrs. M. E.	1	1	0
Wimbledon Corporation	10	10	0
Windsor Corporation	8	8	0
Windsor R.D.C.	6	6	0
Winkworth, Mrs. D. M.		5	0
Women's Advisory Council on Solid Fuel	15	15	0
Women's Gas Federation	26	5	0

	£	s.	d.
Woodall-Duckham Construction Co., Ltd.	105	0	0
Wood Green Corporation	2	2	0
Woolwich Corporation	26	5	0
Wormald, D.	1	1	0
Worthing Corporation	2	2	0
Wycombe R.D.C.	8	8	0
Yiewsley & West Drayton U.D.C.	2	2	0
Zealley, P. R.	1	1	0

South Wales and Monmouthshire Division

	£	s.	d.
Abercarn U.D.C.	6	6	0
Abercwmboi Clean Air Committee	1	1	0
Abertillery U.D.C.	8	8	0
*Bacon, N. P.	2	2	0
Barry Corporation	8	8	0
Bedwas & Machen U.D.C.	6	6	0
Bedwellty U.D.C.	8	8	0
Bridgend U.D.C.	6	6	0
Caerleon U.D.C.	6	6	0
Caerphilly U.D.C.	8	8	0
Cardiff Corporation	37	16	0
Cardiff R.D.C.	8	8	0
Clarke, J. A.	1	5	0
Coal Merchants Federation of Wales	5	5	0
Cwmbran U.D.C.	6	6	0
Ebbw Vale U.D.C.	10	10	0
Fitton, G.	1	1	0
Gellygaer U.D.C.	8	8	0
Glamorgan County Council (2)	100	16	0
Harry, T. W.	1	1	0
Industrial Estate Management Corpn. for Wales	15	15	0
Llanelly Corporation	8	8	0
Llanelly R.D.C.	8	8	0
Llantrisant & Llantwit Fardre R.D.C.	8	8	0
Magor & St. Mellons R.D.C.	6	6	0
Merthyr Tydfil Corporation	10	10	0
Monmouthshire County Council	37	16	0
Mountain Ash U.D.C.	8	8	0
Mynyddislwyn U.D.C.	6	6	0
Neath Corporation	8	8	0
Newport Corporation	26	5	0
Penarth U.D.C.	6	6	0
Pontypool U.D.C.	8	8	0
Pontypridd U.D.C.	8	8	0
Port Talbot Corporation	8	8	0
Rhondda Corporation	26	5	0
Ricsa U.D.C.	6	6	0
Rogers, R. M.	1	1	0
Silburn, Mrs. E.	1	1	0
South Wales Electricity Board	33	0	0
Steel Company of Wales Ltd.	50	0	0
Swansea Corporation	26	5	0
Swansea Port Health Authority	15	15	0
Thomas, Richard & Baldwins Ltd.	15	15	0
Tredegar U.D.C.	6	6	0
Wales Coke Distributors' Asscn.	15	15	0
Wales Gas Board	26	5	0
Ystradgynlais R.D.C.	6	6	0

Overseas Subscriptions

	£	s.	d.
Buschmann, C. H. (Netherlands)	1	1	0
Chamberlin, R. L. (U.S.A.) (2)	3	0	0
Coucke, E. J. (Belgium)	1	1	0
Danson, J. (S. Rhodesia)	1	1	0
Davis, Dr. J. B. (Canada)	1	4	6
De Permentier, P. R. (Belgium)	1	1	0
Durban Corporation (S. Africa)	50	8	0
Feige, H. J. (Israel)	2	0	0
Ferguson, Dr. A. L. (S. Africa)	1	1	0
Geleen, Municipality of (Netherlands)	8	8	0
Gerhardsson, G. (Sweden)	1	1	0
Grafe, Dr. Kurt (Germany)	1	1	0
Guidee, C. (Belgium)	1	1	0
Hanada, K. (Japan)	2	2	0
Hasselhuhn, B. (Sweden)	2	0	0
Hewson, Dr. E. Wendell (U.S.A.) (3)	3	2	6
Hooton, K.A. H. (U.S.A.)	1	1	0
Johannesburg Corpn. (S. Africa)	20	0	0
Johnson, K. R. (S. Africa)	2	0	6
Jones, E. H. (S. Africa)	1	1	0
Jones, Mrs. M. A. (S. Africa) (2)	2	2	0
Kettner, Dr. H. (Germany) (2)	2	2	0
Leichhardt, Municipality of (Australia)	10	10	0
Mueller, Dr. P. K. (U.S.A.)	1	0	0
National Physical Research Laboratory (S. Africa)	5	5	0
Newcastle Corporation (Austraila)	2	2	0
Ottolenghi, A. (Italy)	1	1	0
Pedrero, Dr. P. S. (Spain)	1	2	0
Reif, Dr. A. E. (U.S.A.)	1	1	0
Roberts, L. M. (U.S.A.)	1	13	6
Sordelli, Dr. D. (Italy)	1	1	0
Summers, P. W. (Canada)	2	0	0
Triffett, A. C. (Australia)	1	10	0
Vereeniging Corporation (S. Africa)	1	1	0
Wight, Dr. J. Earle (Canada)	1	1	0
Subscriptions and donations under 5/0		2	6
	£14,218	17	6

Summary of Divisional Accounts

For the year ended December 31, 1964

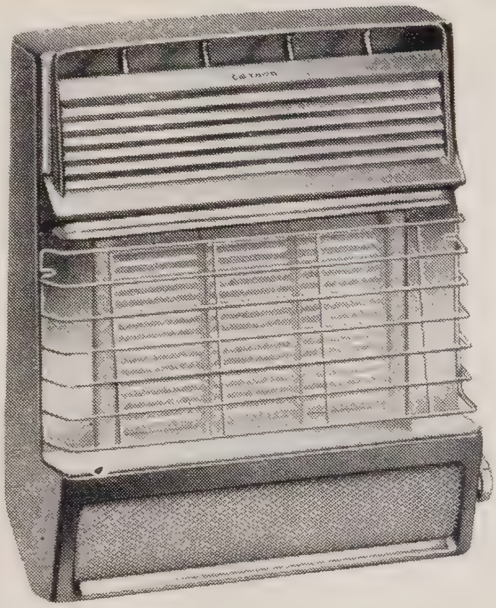
	Commencing balance			*Grants*			*Other income*			*Expenditure*			*Closing balance*		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Scotland	172	1	11	100	0	0	333	1	1(*a*)	423	12	8(*a*)	181	10	4
Northern Ireland	8	5	3	30	0	0	647	19	0(*b*)	391	6	7(*b*)	294	17	8
North West	18	19	1	175	0	0	10	18	0	181	10	10	14	11	11
	Debit.												*Debit.*		
North East	40	1	0	—				17	7	5	2	10	35	15	9
Yorkshire	57	19	0	40	0	0	—			44	17	0	53	2	0
West Midlands	70	16	10	65	0	0	16	16	0	57	16	7	94	16	3
East Midlands	7	18	5	75	0	0	—			72	14	5	10	4	0
South East	15	16	2	100	0	0	3	11	0	106	4	10	13	2	4
South Wales & Mon.	90	19	10	—			15	15	0	35	5	6	71	9	4
Totals	444	19	4	585	0	0	1,028	17	8	1,318	11	3	740	5	9

Notes:—(*a*) includes fees and expenses for Annual Conference and Firemen's Classes.

(*b*) includes fees and expenses for Conference and Exhibition.

GasMiser

'Plus'



the new Fire which will heat
from the Smallest
to the Largest Room
adequately and economically
in the Coldest of
Weather Conditions

A Cannon Quality Product

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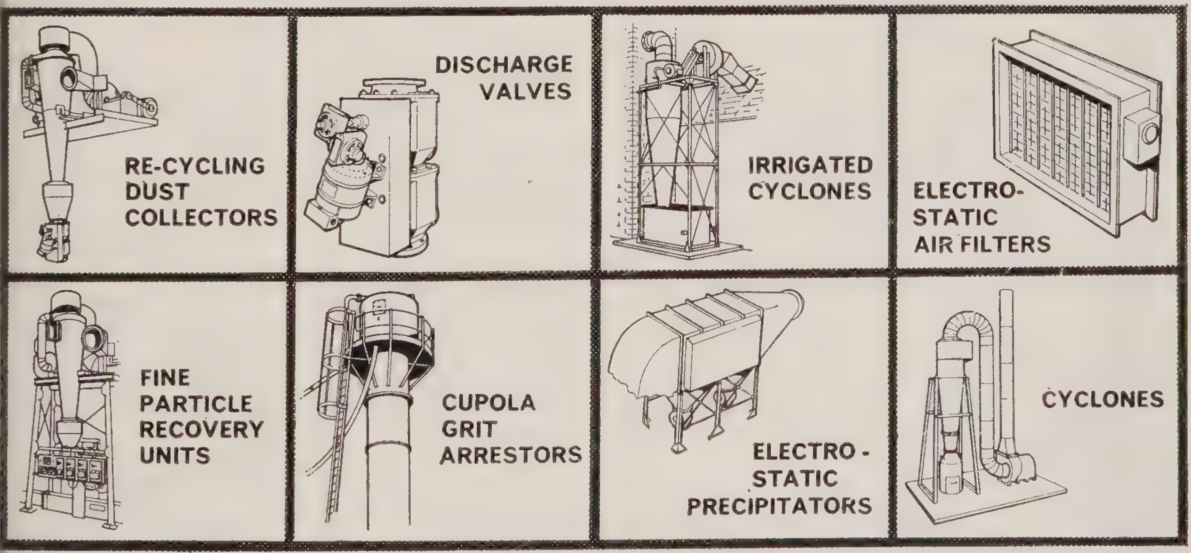
COLLECTRON

DUST COLLECTORS FOR INDUSTRY


RE-CYCLING DUST COLLECTORS
DISCHARGE VALVES
IRRIGATED CYCLONES
ELECTRO-STATIC AIR FILTERS
FINE PARTICLE RECOVERY UNITS
CUPOLA GRIT ARRESTORS
ELECTRO-STATIC PRECIPITATORS
CYCLONES

COLLECTRON LIMITED

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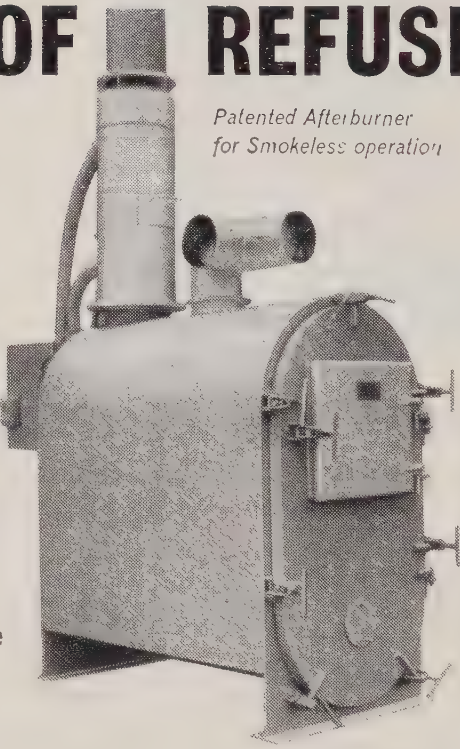
3, BROOK SQUARE, RUGELEY, STAFFORDSHIRE
Telex: 3648 Tel. Rugeley 659/474

FOR REALLY
SMOKELESS
DISPOSAL OF REFUSE



Patented Afterburner for Smokeless operation

THE PATENTED
SEALED FLAME
SMOKELESS
DISPOSAL UNIT

No grates to burn out or clog. Entire front opens to admit largest refuse (saves breaking up). Burns ANYTHING—rubber, plastics, animal, vegetable waste—wet or dry.

NO SMOKE · ODOUR
GRIT · FLY ASH

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TRADE DIRECTORY AND BUYERS' GUIDE

AIR CONDITIONING EQUIPMENT

Air Distribution Equipment Ltd., Bentinck Road, West Drayton, Middlesex (West Drayton 2687). ("*Titus.*")

Airwick Ltd., Stoke Poges Lane, Slough, Buckinghamshire (Slough 20330/22322). ("*Airwick*" *odour counteractant liquids and equipment.*)

Bass, John, Ltd., B.M.B. Crawley Works, Fleming Way, Crawley, Sussex (Crawley 28765) (9 lines). ("*Bassaire*" *Clean Air Equipment.*)

Birfield Filtration Ltd., Bradford Street, Birmingham, 5. (MIDland 7961).

Carrier Engineering Co. Ltd., Carrier House, Warwick Row, London, S.W.1 (VICtoria 6858).

Davidson & Co. Ltd., Sirocco Engineering Works, Belfast, 5, Northern Ireland (Belfast 57251). ("*Sirocco.*")

Harrington, C. H. & Co. Ltd., 38/40 Howard Street, and 15/17 Howard Lane, Sheffield (Sheffield 28537).

Howorth, James & Co. Ltd., Victoria Works, Farnworth, near Bolton, Lancashire (Farnworth 1060-1).
Southern Office: Air Process Units Ltd., Cromwell Road, Camberley, Surrey (Camberley 25071).

Lightfoot Refrigeration Co. Ltd., The, Abbeydale Road, Wembley, Middlesex (PERivale 3322).

Marshall & Parsons Ltd., 1111 London Road, Leigh-on-Sea, Essex (Southend 74867). ("*Draught-Master*" *Automatic one-way air inlet,* "*Flue-Master*" *automatic one-way air intake.*)

Matthews & Yates Ltd., Cyclone Works, Swinton, Manchester (Swinton 2273).

Norris Warming Co. Ltd., Burley House, 5-11 Theobald's Road, London, W.C.1 (HOLborn 7833).
62/63 Lionel Street, Birmingham 3 (CENtral 0981).
2/3 Melrose Avenue, Clifton 8 (Bristol) 30261/5).
Norris House, 611 Stretford Road, Manchester, 16 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 28037).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).
38/40 Elm Grove, Portsmouth (Portsmouth 25551/2).
5/6 Claremont Terrace, Glasgow, C.3 (Douglas 5901/2).

Spencer & Halstead Ltd., Bridge Works, Ossett, Yorkshire (Ossett 821). ("*Spenstead.*")

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233). (*Central and unit plants.*)

AIR DIFFUSERS

Air Distribution Equipment Ltd., Bentinck Road, West Drayton, Middlesex (West Drayton 2687). ("*Titus.*")

Fairitt Engineering (Sales) Ltd., 101 Sandford Road, Moseley, Birmingham, 13 (SOUth 3651). Sales office: 24 Worple Road, Wimbledon, London, S.W.19 (LAKeside 1540). ("*Airmaster.*")

Harrington, C. H., & Co. Ltd., 38/40 Howard Street and 15/17 Howard Lane, Sheffield (Sheffield 28537).

Norris Warming Co. Ltd., Burley House, 5/11 Theobald's Road, London, W.C.1. (HOLborn 7833).
62/63 Lionel Street, Birmingham, 3. (Central 0981).
2/3 Melrose Avenue, Clifton, 8. (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 16. (Trafford Park 3454).
Cross House, Westgate Road, Newcastle. (Newcastle 28037).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).
38/40 Elm Grove, Portsmouth. (Portsmouth 25551/2).
5/6 Claremont Terrace, Glasgow, C.3 (Douglas 5901/2).

AIR POLLUTION MEASUREMENT

Automatic Light Controlling Co. Ltd., 100 Holdenhurst Road, Bournemouth, Hampshire (Bournemouth 21445).

Austen Pumps, Charles, Ltd., Petersham Works, 100 Royston Road, Byfleet, Surrey (Byfleet 43224/5). ("*Dymax*.")

Casella, C. F., & Co. Ltd., Regent House, Britannia Walk, London, N.1 (CLErkenwell 8581/7). (*Scientific and Meteorological Instruments.*)

Elliott Process Automation Ltd., Abbey Road, Park Royal, London, N.W.10 (ELGar 8811).

Fleming Instruments Ltd., Caxton Way, Stevenage, Hertfordshire (Stevenage 804).

Visco Ltd., Stafford Road, Croydon, Surrey. (MUNicipal 3861) (10 lines).

AIR POLLUTION SAMPLING EQUIPMENT (D.S.I.R.)

Glass Developments Ltd., Sudborne Road, Brixton, London, S.W.2 (BRIxton 3370/4041).

AIR PURIFIERS

Machine Control Ltd., Blatchford Road, Horsham, Sussex (Horsham 3215). ("*Emcelair*" *air purifiers.*)

AIR STERILIZATION

Howorth, James, & Co. Ltd., Victoria Works, Farnworth, near Bolton, Lancashire. (Farnworth 1060-1).
Southern Office: Air Process Units Ltd., Cromwell Road, Camberley, Surrey (Camberley 25071).

AUTOMATIC CONTROL EQUIPMENT

Lancashire Dynamo Electronic Products Ltd. (M.I. Group), Rugeley, Staffordshire (Rugeley 371). (*Industrial electronic control equipment.*)

BACTERIA ELIMINATION

Bass, John Ltd., Crawley Works, Fleming Way, Crawley, Sussex (Crawley 28765). ("*Bassaire*" *clean air equipment.*)

Howorth, James & Co. Ltd., Victoria Works, Farnworth, near Bolton, Lancashire (Farnworth 1060-1).
Southern Office: Air Process Units Ltd., Cromwell Road, Camberley, Surrey (Camberley 25071).

BOILERS, DOMESTIC

Allied Ironfounders Ltd., 28 Brook Street, London, W.1. (Grosvenor 8941).
Sales Office: Cadbury Road, Sunbury-on-Thames, Middx. Sunbury (S.M.8) 5577.
(*Aga Domestic Boilers, Allied Industrial Boilers, Rayburn Room Heaters.*)

Clyde Fuel Systems Ltd., Queen Elizabeth Avenue, Hillington, Glasgow, S.W.2 (Halfway 3291) (8 lines).

C.T.C. Heat (London) Ltd., 17 Sloane Street, London, S.W.1 (BELgravia 3478 and 6286).

Potterton, Thomas, Ltd., 20/30 Buckhold Road, London, S.W.18 (VANdyke 7202). ("*Potterton*" *gas and oil fired;* "*Diplomat*" *gas-fired.*)

Steam & Power Development Co. Ltd., 190 Wolverhampton Street, Dudley, Worcestershire (Dudley 53548). ("*Stempo*" *packaged solid smokeless fuel boilers—hot water and steam.*)

Wilson, Henry, & Co. Ltd., P.O. Box No. 6, Kirkby Industrial Estate, near Liverpool, Lancashire (Simonswood 3541) (9 lines). (*Wilson* "*Oilheat*" *oil-fired boilers and burners.*)

BOILERS, INDUSTRIAL

Allied Ironfounders Ltd., 28 Brook Street, London, W.1. (Grosvenor 8941).
Sales Office: Cadbury Road, Sunbury-on-Thames, Middx. Sunbury (S.M.8) 5577.
(*Aga Domestic Boilers, Allied Industrial Boilers, Rayburn Room Heaters.*)

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321). ("*Babcock.*")
Winchester House, Victoria Square, Birmingham, 2 (Midland 6741).
145 St. Vincent Street, Glasgow, C.2 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 4908).
Norfolk House, Grey Street, Newcastle-upon-Tyne (29212).
Aylward House, Wine Street, Bristol, 1 (294561).

Binner, T. G. (Boilers) Ltd., New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

Clyde Fuel Systems Ltd., Queen Elizabeth Avenue, Hillington, Glasgow, S.W.2 (Halfway 3291) (8 lines).

Cochran & Co. (Annan) Ltd., Annan, Dumfriesshire, Scotland (Annan 2111). London Office: Lesley Court, 22-23 Strutton Ground, Westminster, London, S.W.1 (ABBey 4441). (*Land and marine boilers and pressure vessels.*)

Cradley Boiler Co. Ltd., Cradley Heath, Staffordshire (Cradley Heath 66003/5).

C.T.C. Heat (London) Ltd., 17 Sloane Street, London, S.W.1 (BELgravia 3478 and 6286).

Danks, Edwin & Co. (Oldbury) Ltd., P.O. Box No. 4, Oldbury, Birmingham (Broadwell 2531) (9 lines).

G.W.B. Furnaces Ltd., P.O. Box No. 4, Dibdale Works, Dudley, Worcestershire (Dudley 55455).

Marshall, Sons & Co. Ltd., Britannia Works, Gainsborough, Lincolnshire (Gainsborough 2301). (*Marshall automatic boilers.*)

Potterton, Thomas, Ltd., 20/30 Buckhold Road, London, S.W.18 (VANdyke 7202). ("*Potterton*" *and* "*Diplomat*".)

Spanner Boilers Ltd., Wokingham Road, Bracknell, Berkshire (Bracknell 1500).

Steam & Power Development Co. Ltd., 190 Wolverhampton Street, Dudley, Worcestershire (Dudley 53548). ("*Stempo*" *package, hot water, steam, solid smokeless fuel.*)

Stone, J. & Co. (Deptford) Ltd., Stone-Vapor Boiler Division, Arklow Road, London, S.E.14 (TIDeway 1202). (*Stone-Vapor Boilers.*)

Suxé Combustion Ltd., Cupid Green Foundry, Hemel Hempstead, Hertfordshire (Boxmoor 3631). (*Möring boilers.*)

Wilson, Henry & Co. Ltd., P.O. Box No. 6, Kirkby Industrial Estate, near Liverpool, Lancashire (Simonswood 3541) (9 lines). (*Wilson* "*Oilheat*" *oil-fired boilers and burners.*)

BOILERS, INDUSTRIAL (SOLID FUEL)

Cradley Boiler Co. Ltd., Cradley Heath, Staffordshire (Cradley Heath 66003/5).

Danks, Edwin & Co. (Oldbury) Ltd., P.O. Box No. 4, Oldbury, Birmingham (Broadwell 2531) (9 lines).

Steam & Power Development Co. Ltd., 190 Wolverhampton Street, Dudley. Worcestershire (Dudley 53548). ("*Stempo*" *package, hot water, steam, solid fuel. Smokeless firing of bituminous coal.*)

Suxé Combustion Ltd., Cupid Green Foundry, Hemel Hempstead, Hertfordshire (Boxmoor 3631). (*Möring boilers.*)

Vauxhall Boiler Co. Ltd., Banbury, Oxfordshire (Banbury 3437). ("*Ambassador*" *and* "*Bouellat*" *boilers.*)

BOILERS, PACKAGED (OIL-FIRED)

Cochran & Co. (Annan) Ltd., Annan, Dumfriesshire, Scotland (Annan 2111).
London Office: Lesley Court, 22-23 Strutton Ground, Westminster, London, S.W.1 (ABBey 4441).
(*Land and marine boilers and pressure vessels.*)

Cradley Boiler Co. Ltd., Cradley Heath, Staffordshire (Cradley Heath 66003/5).

Danks, Edwin & Co. (Oldbury) Ltd., P.O. Box No. 4, Oldbury, Birmingham (Broadwell 2531) (9 lines).

Spanner Boilers Ltd., Wokingham Road, Bracknell, Berkshire (Bracknell 1500).

Stone, J. & Co. (Deptford) Ltd., Stone-Vapor Boiler Division, Arklow Road, London, S.E.14 (TIDeway 1202). ("*Stone-Vapor.*")

Vauxhall Boiler Co. Ltd., Banbury, Oxfordshire (Banbury 3437). ("*Ambassador*" *and* "*Bouellat*" *boilers.*)

BRICKWORK, BOILER SETTING

Chimney Construction Co. Ltd., Hagley Road, Stourbridge, Worcestershire (Stourbridge 5623).

Topping & Leggat, 13 Old Park Road, London, N.13 (PALmers Green 3268).

BURNERS, GAS

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321). ("*Babcock.*")
Winchester House, Victoria Square, Birmingham 2 (Midland 6741).
145 St. Vincent Street, Glasgow, C.2 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 4908).
Norfolk House, Grey Street, Newcastle-upon-Tyne (29212).
Aylward House, Wine Street, Bristol, 1 (294561).

G.W.B. Furnaces Ltd., P.O. Box No. 4, Dibdale Works, Dudley, Worcestershire (Dudley 55455.)

Radiant-Heating Ltd., 475 Foleshill Road, Coventry (Coventry 88655). (*Industrial.*)

BURNERS, OIL

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321). ("*Babcock.*")
Winchester House, Victoria Square, Birmingham, 2 (Midland 6741).
145 St. Vincent Street, Glasgow, C.2 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 4908).
Norfolk House, Grey Street, Newcastle-upon-Tyne (29212).
Aylward House, Wine Street, Bristol, 1 (294561).

Clyde Fuel Systems Ltd., Queen Elizabeth Avenue, Hillington, Glasgow, S.W.2 (Halfway 3291) (8 lines).

C.T.C. Heat (London) Ltd., 17 Sloane Street, London, S.W.1 (BELgravia 3478 and 6286).

Danks, Edwin & Co. (Oldbury) Ltd., P.O. Box No. 4, Oldbury, Birmingham (Broadwell 2531) (9 lines).

G.W.B. Furnaces Ltd., P.O. Box No. 4, Dibdale Works, Dudley, Worcestershire (Dudley 55455).

Hope's Heating & Engineering Ltd., Halford Works, Smethwick, Birmingham 40 (Smethwick 2191).
16 Berners Street, London, W.1 (MUSeum 8412).
8 Cumberland Road, Leeds 6 (Leeds 59331).
Splott Works, Walker Road, Cardiff (Cardiff 23581-2).
7 Pier Street, Hull (Hull Central 35346).

Riley (I.C.) Products Ltd., 19 Woburn Place, London, W.C.1 (TERminus 2622). (*Oil burners, mechanical stokers, incinerators.*)

Swinney Brothers Ltd., Morpeth, Northumberland (Morpeth 3291).
2 The Broadway, London, W.6 (RIVerside 9611) ("*Enterprise*" *Rotary Oil Burners*).

Wilson, Henry & Co. Ltd., P.O. Box No. 6, Kirkby Industrial Estate, near Liverpool, Lancashire (Simonswood 3541) (9 lines). (*Wilson* "*Oilheat*" *oil-fired boilers and burners.*)

BURNERS, SOLID FUEL

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321). ("*Babcock.*")
Winchester House, Victoria Square, Birmingham, 2 (Midland 6741).
145 St. Vincent Street, Glasgow, C.2 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 4908).
Norfolk House, Grey Street, Newcastle-upon-Tyne (29212).
Aylward House, Wine Street, Bristol, 1 (294561).

Riley (I.C.) Products Ltd., 19 Woburn Place, London, W.C.1 (TERminus 2622). (*Oil burners, mechanical stokers, incinerators.*)

Suxé Combustion Ltd., Cupid Green Foundry, Hemel Hempstead, Hertfordshire (Boxmoor 3631). (*Suxé*).

CEILINGS, HEATED

James, Richard (Westminster) Ltd., Ferry Works, Lacy Road, London, S.W.15 (PUTney 7792). (*Embedded hot water systems and Plasrib hot water heated acoustic ceilings.*)

Norris Warming Co. Ltd., Burley House, 5/11 Theobald's Road, London, W.C.1 (HOLborn 7833).
62/63 Lionel Street, Birmingham, 3 (Central 0981).
2/3 Melrose Avenue, Clifton, 8 (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 16 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 28037).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).
38/40 Elm Grove, Portsmouth (Portsmouth 25551/2).
5/6 Claremont Terrace, Glasgow, C.3 (Douglas 5901/2).

CENTRAL HEATING SYSTEMS

Baxi, Richard Baxendale & Sons, Bamber Bridge, Preston, Lancashire (Preston 35271). ("*Baxi*" *open-fire and gas warm air systems.*)

British Coking Industry Association, 74 Grosvenor Street, London, W.1 (MAYfair 9736). (*Sunbrite.*)

Dimplex Ltd., Millbrook, Southampton, Hampshire (Southampton 74425/9).

Ford, John, Engineers (Plymouth) Ltd., Hillcrest Works, Oakfield Terrace Road, Cattedown, Plymouth, South Devon (Plymouth 63351/2).

James, Richard (Westminster) Ltd., Ferry Works, Lacy Road, Putney, London, S.W.15 (PUTney 7792).

Jones & Campbell Ltd., Torwood Foundry, Larbert, Stirlingshire (Larbert 2114) (4 lines).

Norris Warming Co. Ltd., Burley House, 5/11 Theobald's Road, London, W.C.1 (HOLborn 7833).
62/63 Lionel Street, Birmingham, 3 (Central 0981).
2/3 Melrose Avenue, Clifton, 8 (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 16 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 28037).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).
38/40 Elm Grove, Portsmouth (Portsmouth 25551/2).
5/6 Claremont Terrace, Glasgow, C.3 (Douglas 5901/2).

Radiation Central Heating Ltd., Radiation House, North Circular Road, London, N.W.10. (WILlesden 1234) (*Small-bore and "Ductair" warmed air.*)

Radiation Parkray Ltd., Radiation House, North Circular Road, London. N.W.10 (WILlesden 1234).

Waring Heating Co. Ltd., Heating and domestic engineers, High Street, Wollaston, Stourbridge (Stourbridge 4321).

Webb, R. E., M.R.P.H., 71A Garden Walk, Cambridge (Cambridge 58558).

CENTRAL OIL DISTRIBUTION SYSTEMS

BM Controls, 36 Kingston Road, Staines, Middlesex (Staines 51166). ("*BM*" *oil control valves, Oil lifters, etc.*)

Reeve, E. G. & Sons Ltd. Burton Road, St. Faith's Industrial Estate, Norwich, Norfolk (NOR 84 N) (Norwich 47228/9/0)

Shell Mex and B.P. Ltd., Shell-Mex House, Strand, London, W.C.2 (TEMple Bar 1234).

CHIMNEYS

Binner, T. G. (Boilers) Ltd., New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

Beaumont, F. E., Ltd., Rathgar Road, Brixton, London, S.W.9 (BRIxton 4066, Telex: 25837). ("*Beauvent*" *steel chimneys and* "*Beauval*" *aluminium cladding.*)

Chimney Construction Co. Ltd., Hagley Road, Stourbridge, Worcestershire (Stourbridge 5623). (*Brick chimneys and boiler setting brickwork.*)

Cochran & Co. (Annan) Ltd., Annan, Dumfriesshire, Scotland (Annan 2111).
London Office: Lesley Court, 22-23 Strutton Ground, Westminster, London, S.W.1 (ABBey 4441).

Combustion Equipment Ltd., 322 St. John Street, London, E.C.1 (BRUnswick 7785/6). (*Cory grit arresters, aluminium cladding for chimneys, Dribore chimneys, furnace baffle for shell boilers, waste material disposal furnaces.*)

Danks, Edwin & Co. (Oldbury) Ltd., P.O. Box No. 4, Oldbury, Birmingham (Broadwell 2531) (9 lines).

Jukes, Frederick Ltd., Royston Works, Redditch Road, Stoke Heath, Bromsgrove, Worcestershire (Bromsgrove 3344). (*Steel Chimneys.*)

Neil, W. & Co. Ltd., 14a Hog Hill Road, Collier Row, Romford, Essex (Romford 61958).

Reeve, E. G. & Sons Ltd., Burton Road, St. Faith's Industrial Estate, Norwich, Norfolk (NOR 84 N) (Norwich 47228/9/0).

Rodway & Taylor (Birmingham) Ltd., 85-90 Buckingham Street, Birmingham 19 (Central 4027-8). (*Dust, fume, ventilating and heating engineers.*)

Tipton Tub & Tube Co. Ltd., Bloomfield Road, Tipton, Staffordshire (Tipton 1011 & 3418).

Topping & Leggat, 13 Old Park Road, London, N.13 (PALmers Green 3268).

Wright & Summerhill Ltd., Lupton Street, Leeds 10 (Leeds 75434/5). (*Sheet metal, ventilating and light constructional engineers.*)

CHIMNEY CLADDING (ALUMINIUM)

Beaumont, F. E. Ltd., Rathgar Road, Brixton, London, S.W.9 (BRIxton 4066, Telex: 25837). ("*Beauval*" *aluminium insulating cladding.*)

Combustion Equipment Ltd., 322 St. John Street, London, E.C.1 (BRUnswick 7785/6). (*Cory grit arresters, Dribore chimneys, furnace baffle for shell boilers, waste material disposal furnaces.*)

Harrington, C. H. & Co. Ltd., 38/40 Howard Street and 15/17 Howard Lane, Sheffield, 1 (Sheffield 28537).

CHIMNEY THROAT RESTRICTORS FOR DOMESTIC CHIMNEYS

Lathe, Charles & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffs. (Tipton 1887). ("*Claco*" *solid fuel burning appliances.*)

Magni Reflector Co. Ltd., 10 Market Road, Chichester, Sussex (Chichester 3279). (*The Magni heat reflecting chimney throat unit.*)

CLEAN AIR SUPPLY UNITS

Machine Control Ltd., Blatchford Road, Horsham, Sussex (Horsham 3215). ("*Emcel*" *units.*)

CLEAN ROOMS

Air Movement Ltd., Central Design Office, Dover Road, Northfleet, Kent (Gravesend 64844). ("*Amaire*").

Bass, John, Ltd., B.M.B. Crawley Works, Fleming Way, Crawley, Sussex (Crawley 28765) (9 lines). ("*Bassaire*" *clean air equipment.*)

Birfield Filtration Ltd., Bradford Street, Birmingham, 5 (MIDland 7961).

Constant Air Systems Ltd., Shaftesbury House, Northolt Road, Harrow, Middlesex (CONcord 0288).

Norris Warming Co. Ltd., Burley House, 5/11 Theobald's Road, London, W.C.1 (HOLborn 7833).
62/63 Lionel Street, Birmingham, 3 (Central 0981).
2/3 Melrose Avenue, Clifton, 8 (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 16 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 28037).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).
38/40 Elm Grove, Portsmouth (Portsmouth 25551/2).
5/6 Claremont Terrace, Glasgow, C.3 (Douglas 5901/2).

COAL HANDLING PLANT

Buell Ltd., 8-10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761).
Imperial Steel Works, Sheffield, 9 (Sheffield 49054).

Danks, Edwin & Co. (Oldbury) Ltd., P.O. Box No. 4, Oldbury, Birmingham (Broadwell 2531) (9 lines).

Proctor, James, Ltd., P.O. Box No. 19, Hammerton Street, Burnley, Lancashire (Burnley 3102).

Thompson, John (Triumph) Ltd., Triumph Works, Kirkstall Road, Leeds, 3, Yorkshire (Leeds 34841). ("*Triumph*" *stokers.*)

COMBUSTION TESTING EQUIPMENT

Elliott Process Automation Ltd., Abbey Road, Park Royal, London, N.W.10 (ELGar 8811).

Shandon Scientific Co. Ltd., 65 Pound Lane London, N.W.10 (WILlesden 8671). ("*Fyrite*" *CO*$_2$ *indicator,* "*True Spot*" *smoke tester,* "*MZF*" *draft gauge* "*Bacharach*" *combustion testing equipment.*

CONTRACTORS, HEATING, VENTILATING AND AIR CONDITIONING

Adams & Adams Ltd., Heating and Ventilating Engineers, 4 Carlton Crescent, Southampton (Southampton 22602).

American Moistening Co. Ltd., Cheapside Chambers, Cheapside, Bradford, 1 (Bradford 21906). ("*Amco*" *atomizers, dry duct systems.*)

Andrews-Weatherfoil Ltd., 185 Bath Road, Slough, Buckinghamshire (Slough 23871).
Turncroft Lane, Stockport, Cheshire (Stockport 3441).
Lambeg Mills, Lisburn, Co. Antrim, Northern Ireland (Dunmurry 2542/3).

Bass, John, Ltd., Crawley Works, Fleming Way, Crawley, Sussex (Crawley 28765). ("*Bassaire*" *clean air equipment.*)

Borsari & Co., Zollikon-Zurich, Switzerland (24 96 18). (*Tile-lined underground fuel oil storage tanks of reinforced concrete.*)

Carrier Engineering Co. Ltd., Carrier House, Warwick Row, London, S.W.1 (VICtoria 6858).

Constant Air Systems Ltd., Shaftesbury House, Northolt Road, Harrow, Middlesex (CONcord 0288).

Duscon Engineering Ltd., Union Works, Union Lane, Droitwich, Worcestershire (Droitwich 2027/8).

Ford, John, Engineers (Plymouth) Ltd., Hillcrest Works, Oakfield Terrace Road, Cattedown, Plymouth, South Devon (Plymouth 63351/2).

Grindrod, Alfred & Co. Ltd., 122 Charles Street, Sheffield, 1 (Sheffield 27591).

Harrington, C. H. & Co. Ltd., 38/40 Howard Street and 15/17 Howard Lane, Sheffield, 1. (Sheffield 28537).

Hope's Heating & Engineering Ltd., Halford Works, Smethwick, Birmingham 40 (Smethwick 2191).
16 Berners Street, London, W.1 (MUSeum 8412).
8 Cumberland Road, Leeds (Leeds 59331).
Splott Works, Walker Road, Cardiff (Cardiff 23581-2).
7 Pier Street, Hull (Hull Central 35346).

Howorth, James & Co. Ltd., Victoria Works, Farnworth, near Bolton, Lancashire, (Farnworth 1060-1).
Southern Office: Air Process Units Ltd., Cromwell Road, Camberley, Surrey (Camberley 25071).

James, Richard (Westminster) Ltd., Ferry Works, Lacy Road, Putney, London, S.W.15 (PUTney 7792).

Morgan Air Treatments Ltd., 55/57 Salop Street, Birmingham 12 (Victoria 2096).

Norris Warming Co. Ltd., Burley House, 5/11 Theobald's Road, London, W.C.1 (HOLborn 7833).
62/63 Lionel Street, Birmingham, 3 (Central 0981).
2/3 Melrose Avenue, Clifton, 8 (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 16 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 28037).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).
38/40 Elm Grove, Portsmouth (Portsmouth 25551/2).
5/6 Claremont Terrace, Glasgow, C.3 (Douglas 5901/2).

Rodway & Taylor (Birmingham) Ltd., 85-90 Buckingham Street, Birmingham, 19 (Central 4027-8). (*Dust, fume, ventilating and heating engineers.*)

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233). (*Plenum, tempered and filtered air supply, high and medium pressure hot water.*)

CONVECTORS

Dimplex Ltd., Millbrook, Southampton, Hampshire (Southampton 74425/9).

Ekco Heating & Electrical Ltd., 41/47 Old Street, London, E.C.2 (CLErkenwell 7142).

Lathe, Charles & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffs. (Tipton 1887). ("*Claco*" *solid fuel burning appliances.*)

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

Radiation Parkray Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

COOLERS

Buell Ltd., 8-10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761).
Imperial Steel Works, Sheffield, 9. (Sheffield 49054).

Carrier Engineering Co. Ltd., Carrier House, Warwick Row, London, S.W.1 (VICtoria 6858).

Heenan & Froude Ltd., Shrub Hill, Worcester (Worcester 23461) (14 lines).

Visco Ltd., Stafford Road, Croydon, Surrey (MUNicipal 3861). (10 lines).

DAMPERS

Combustion Equipment Ltd., 322 St. John Street, London, E.C.1 (BRUnswick 7785/6). (*Cory grit arresters, aluminium cladding for chimneys, Dribore chimneys, furnace baffle for shell boilers, waste material disposal furnaces. "Airlok" sealing dampers.*)

Fairitt Engineering (Sales) Ltd., 101 Sandford Road, Moseley, Birmingham, 13. (SOUth 3651).
Sales Office: 24 Worple Road, Wimbledon, London, S.W.19 (LAKeside 1540) ("*Airmaster*").

DEHUMIDIFIERS

Carrier Engineering Co. Ltd., Carrier House, Warwick Row, London, S.W.1 (VICtoria 6858).

Heather Filters Limited, 7 Kendall Place Baker Street, London, W.1 (HUNter 1801). ("*Humexair*").

Lightfoot Refrigeration Co. Ltd., The, Abbeydale Road, Wembley, Middlesex (PERivale 3322).

DISCHARGE VALVES

Collectron Ltd., 32 Aylmer Road, Leytonstone, London, E.11 (LEYtonstone 3085 & 4709).
3 Brook Square, Rugeley, Staffordshire (Rugeley 659).
(*Continuous discharge valves.*)

Nailsea Engineering Co. Ltd., Samlesbury Airfield near Blackburn, Lancashire (Mellor 666). (*"Pnu-Jet" reverse jet filters and continuous discharge valves.*)

DUCT HEATERS

Air Heaters Colchester Ltd., 66 Barrack Street, Colchester, Essex (Colchester 78484).

DUCTING

Bass, John, Ltd., B.M.B. Crawley Works, Fleming Way, Crawley, Sussex. (Crawley 28765) (9 lines).

Bell Bros. (Pudsey) Ltd., Green Lane, Smalewell Road, Pudsey, Yorkshire (Pudsey 5715/6).

Binner, T. G. (Boilers) Ltd., New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

Ford, John, Engineers (Plymouth) Ltd., Hillcrest Works, Oakfield Terrace Road, Cattedown, Plymouth, South Devon (Plymouth 63351/2).

Hainault Engineering Co. Ltd., Fowler Road, Hainault, Essex (Hainault 4426).
21 Evesham Avenue, Whitley Bay, Northumberland (20588).
(*"Hainault" industrial oil-fired air heaters.*)

Harrington, C. H. & Co. Ltd., 38/40 Howard Street and 15/17 Howard Lane, Sheffield, 1. (Sheffield 28537).

Jukes, Frederick, Ltd., Royston Works, Redditch Road, Stoke Heath, Bromsgrove, Worcestershire (Bromsgrove 3344).

Radiation Central Heating Ltd., Radiation House, North Circular Road, London, N.W.10. (WILlesden 1234).

Tipton Tub & Tube Co. Ltd., Bloomfield Road, Tipton, Staffordshire (Tipton 1011 & 3418).

Wright & Summerhill Ltd., Lupton Street, Leeds, 10 (Leeds 75434/5). (*Sheet metal, ventilating and light constructional engineers, "Ventwright" canopies, incorporating fans, filters, grilles, louvres, etc.*)

DUST CLASSIFICATION PLANT

Buell Ltd., 8-10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761).
Imperial Steel Works, Sheffield, 9 (Sheffield 49054).

Collectron Ltd., 32 Aylmer Road, Leytonstone, London, E.11 (LEYtonstone 3085/4709).
3 Brook Square, Rugeley, Staffordshire (Rugeley 659).

DUST COLLECTING EQUIPMENT

Dust Control Equipment Ltd., Thurmaston, Leicestershire (Syston 3333). (*Dust control units, wet dedusters, semi- and fully-automatic fabric filters, cyclone installations.*)

Western Precipitation Division, Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711). (*"Multiclone" mechanical collectors.*)

DUST COLLECTING PLANT

Alldays & Onions Ltd., P.O. Box 234, Great Western Works, Sydenham Road, Birmingham, 11 (Vic. 2251/4).

Ambuco Ltd., 49 Moorgate, London, E.C.2 (METropolitan 9242/4).
Dron & Dickson Ltd., 158 Bath Street, Glasgow, C.2 (Douglas 1337). (*Ambuco Cyclones, scrubbers and fabric arresters*).

Andrews-Weatherfoil Ltd., 185 Bath Road, Slough, Buckinghamshire (Slough 23871).
Turncroft Lane, Stockport, Cheshire (Stockport 3441).
Lambeg Mills, Lisburn, Co. Antrim, Northern Ireland (Dunmurry 2542/3).

Bell Bros. (Pudsey) Ltd., Green Lane, Smalewell Road, Pudsey, Yorkshire (Pudsey 5715/6).

Bigwood, Joshua & Son Ltd., Wednesfield Road, Wolverhampton (Wolverhampton 24771).

British Vacuum Cleaner & Engineering Co. Ltd., Goblin Works, Leatherhead, Surrey Ashtead 6121).

Buell Ltd., 8-10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761).
Imperial Steel Works, Sheffield, 9 (Sheffield 49054).

Chemical Construction (G.B.) Ltd., Regal House, Twickenham, Middlesex (POPesgrove 4455). ("*Chemico*"—*Pease Anthony Venturi scrubbers*).

Collectron Ltd., 32 Aylmer Road, Leytonstone, London, E.11 (LEYtonstone 3085 & 4709).
3 Brook Square, Rugeley, Staffordshire. (Rugeley 659). ("*Collectron*" *dust collectors.*)

Combustion Equipment Ltd., 322 St. John Street, London, E.C.1 (BRUnswick 7785/6). (*Cory grit arresters, aluminium cladding for chimneys, Dribore chimneys, furnace baffle for shell boilers, waste material disposal furnaces.*)

Constant Air Systems Ltd., Shaftesbury House, Northolt Road, Harrow, Middlesex (CONcord 0288).

Drummond Dust & Fume Extractors Ltd., Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (LARkswood 4441). ("*Drummond*" *dust and fume extractors.*)

Dunford & Elliott Process Engineering Ltd., 143 Maple Road, Surbiton, Surrey (KINgston 7799). (*Dust control and collection systems*).

Duscon Engineering Ltd., Union Works, Union Lane, Droitwich, Worcestershire (Droitwich 2027/8). ("*Dusclone*" *centrifugal separators and* "*Duspak*" *fabric filters.*)

Dust Control Equipment Ltd., Thurmaston, Leicestershire (Syston 3333). (*Dust control units, wet dedusters, semi- and fully-automatic fabric filters, cyclone installations.*)

Fan Systems Ltd., 2 Brazil Street, Manchester, 1 (Central 7156/7/8). (*Fans and ancillary equipment.*)

Heat Economy Ltd., 13 Kentish Town Road, London, N.W.1 (GULliver 1233 & 2512).

Howorth, James, & Co. Ltd., Victoria Works, Farnworth, near Bolton, Lancashire (Farnworth 1060-1).
Southern Office: Air Process Units Ltd., Cromwell Road, Camberley, Surrey (Camberley 25071).

Industrial & Metallurgical Equipment Ltd., Wettern House, Dingwell Road, Croydon, Surrey (MUNicipal 3641). ("*Elbair*" *gas cleaning system.*)

Jukes, Frederick Ltd., Royston Works, Redditch Road, Stoke Heath, Bromsgrove, Worcestershire (Bromsgrove 3344).

Lodge-Cottrell Ltd., George Street Parade, Birmingham, 3 (Central 3388). (*Electrical precipitation*).

Morgan Air Treatments Ltd., 55/57 Salop Street, Birmingham, 12 (Victoria 2096).

Musgrave & Co. Ltd., St. Ann's Works Belfast, 5 (Belfast 59411) (8 lines).
46-50 Coombe Road, New Malden, Surrey (Malden 9241).

Nailsea Engineering Co. Ltd., Samlesbury Airfield, near Blackburn, Lancashire (Mellor 666). ("*Pnu-jet*" *reverse jet filters.*)

Newton Collins Ltd., Barford Street Works, Birmingham, 5 (Midland 3670). ("*Dustrol*".)

Richardson, R. J. & Sons Ltd., Engineering & Shotblast Works, 37 Commercial Street, Birmingham, 1 (Midland 2281 P.B.X.). (*High temperature, high efficiency dust and fume extraction and filtration, normal dust extraction and collection, electrostatic precipitation, super cleaning of atmospheric air.*)

Rodway & Taylor (Birmingham) Ltd., 85-90 Buckingham Street, Birmingham, 19 (Central 4027-8). (*Dust, fume, ventilating and heating engineers*).

Spencer & Halstead Ltd., Bridge Works, Ossett, Yorkshire (Ossett 821). ("*Spenstead.*")

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233). (*Electrostatic precipitators, scrubbers, textile filters, cyclones.*)

Tilghmans Ltd., Broadheath, Altrincham, Cheshire (Altrincham 4242) (9 lines).

Tipton Tub & Tube Co. Ltd., Bloomfield Road, Tipton, Staffordshire (Tipton 1011 & 3418).

Visco Ltd., Stafford Road, Croydon, Surrey (MUNicipal 3861) (10 lines).

Wellman Incandescent Furnace Co. Ltd., Cornwall Road, Smethwick, 40, Staffordshire (Smethwick 2121). (*Incandescent-Whiting dust collectors for cupolas.*)

Western Precipitation Division, Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711). ("*Multiclone*" *mechanical collectors.*)

DUST SAMPLING EQUIPMENT

Airflow Developments Ltd., Lancaster Road, High Wycombe, Buckinghamshire (High Wycombe 5252).

Casella, C. F. & Co. Ltd., Regent House, Britannia Walk, London, N.1 (CLErkenwell 8581/7). (*Scientific and meteorological instruments.*)

Elliott Process Automation Ltd., Abbey Road, Park Royal, London, N.W.10 (ELGar 8811).

Fleming Instruments Ltd., Caxton Way, Stevenage, Hertfordshire (Stevenage 804).

ECONOMISERS, FUEL

Combustion Equipment Ltd., 322 St. John Street, London, E.C.1 (BRUnswick 7785/6). (*Cory grit arresters, aluminium cladding for chimneys, Dribore chimneys, furnace baffle for shell boilers, waste material disposal furnaces.*)

ELECTRIC HEATING EQUIPMENT

Air Heaters Colchester Ltd., 66 Barrack Street, Colchester, Essex (Colchester 78484).

Catterson-Smith, R. M. Ltd., Adams Bridge Works, Exhibition Grounds, Wembley, Middlesex (WEMbley 4291). (*Electric furnaces and ovens.*)

Dimplex Ltd., Millbrook, Southampton, Hampshire (Southampton 74425/9).

Ekco Heating & Electrical Ltd., 41/47 Old Street, London, E.C.2 (CLErkenwell 7142).

Isopad Ltd., Barnet-By-Pass, Boreham Wood Herts. (ELStree 2817-18-19-10).

Lesser, David C. & Co. Ltd., 10 Balaclava Road, King's Heath, Birmingham, 14 (Highbury 5435). ("*Lestric*" *and* "*Priory*" *electric fires, fan heaters, towel rails.*)

ELECTRIC UNIT STORAGE HEATERS

Dimplex Ltd., Millbrook, Southampton, Hampshire (Southampton 74425/9).

Ekco Heating & Electrical Ltd., 41/47 Old Street, London, E.C.2 (CLErkenwell 7142).

ELECTRICAL PRECIPITATORS

Collectron Ltd., 32 Aylmer Road, Leytonstone, London, E.11 (LEYtonstone 3085/4709).
3 Brook Square, Rugeley, Staffordshire (Rugeley 659).

Head Wrightson Iron & Steel Works Engineering Ltd., Teesdale Ironworks, Thornaby-on-Tees, Co. Durham (Stockton 62241).

Locker Industries (Sales) Ltd., Church Street, Warrington, Lancashire (Warrington 34111).
London Office: Clune House, 17 Surrey Street, Strand, London, W.C.2. (TEMple Bar 4059/8559).

Lodge-Cottrell Ltd., George Street Parade, Birmingham, 3 (Central 3388). (*Electrical precipitation.*)

Musgrave & Co. Ltd., St. Ann's Works, Belfast, 5 (Belfast 59411) (8 lines).
46/50 Coombe Road, New Malden, Surrey (MALden 9241).

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233).

Western Precipitation Division, Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711). ("*Cottrell*" *electrostatic precipitators.*)

EXHIBITION AND DISPLAY CONTRACTORS

Autur Display Organisation Ltd., 66 St. Paul Street, Islington, London, N.1 (CANonbury 7727). (*Official stand contractors for National Clean Air Exhibition since* 1960.)

Central Display Co. Ltd., 47-49 Bendon Valley, Earlsfield, London, S.W.18 (VANdyke 8044/7).

Princedale Electrical Co. Ltd., 205 Warwick Road, Kensington, London, W.14 (WEStern 3727/8). (*Official Electrical Contractors, National Clean Air Exhibition,* 1963, 1964 *and* 1965.)

EXTRACTOR FANS (DOMESTIC)

Ekco Heating & Electrical Ltd., 41/47 Old Street, London, E.C.2 (CLErkenwell 7142).

FANS

Aerex Ltd., Cavendish Buildings, 220 West Street, Sheffield, 1 (Sheffield 28441).
London Office: 18 Buckingham Gate, London, S.W.1 (TATe Gallery 7292).
Northern Office: Barton Chambers, Off St. Ann's Square, Manchester, 2 (DEAnsgate 6477).
Midlands Office: Portland Buildings, Portland Place, Aldridge, Staffordshire (Aldridge 52173).
Southern Office: 5 London Road, Camberley, Surrey (Camberley 5228).

Alldays & Onions Ltd., P.O. Box 234, Great Western Works, Sydenham Road, Birmingham, 11 (Vic. 2551/4).

Bass, John, Ltd., B.M.B. Crawley Works, Fleming Way, Crawley, Sussex (Crawley 28765) (9 lines).

British Vacuum Cleaner & Engineering Co. Ltd., Goblin Works, Leatherhead, Surrey (Ashtead 6121).

Davidson & Co. Ltd., Sirocco Engineering Works, Belfast, 5, Northern Ireland (Belfast 57251). ("*Sirocco*").

Fan Systems Ltd., 2 Brazil Street, Manchester, 1 (Central 7156/7/8). (*Fans and ancillary equipment.*)

Harrington, C. H. & Co., Ltd., 38/40 Howard Street and 15/17 Howard Lane, Sheffield, 1 (Sheffield 28537).

Matthews & Yates Ltd., Cyclone Works, Swinton, Manchester (Swinton 2273).

Musgrave & Co. Ltd., St. Ann's Works, Belfast, 5 (Belfast 59411) (8 lines).
46-50 Coombe Road, New Malden, Surrey (Malden 9241).

Spencer & Halstead Ltd., Bridge Works, Ossett, Yorkshire (Ossett 821). ("*Spenstead.*")

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233).

"FIBERGLAS" U.K. DISTRIBUTORS

Chemical Trading Co. Ltd., Cree House, 18-20, Creechurch Lane, London, E.C.3 (AVEnue 5488).

FILTERS, AIR

Birfield Filtration Ltd., Bradford Street, Birmingham, 5 (MIDland 7961). ("*Far-Air*" *filters*)

British Vacuum Cleaner & Engineering Co. Ltd., Goblin Works, Leatherhead, Surrey (Ashtead 6121).

Delbag Air Filters Ltd., 15 Kensington High Street, London, W.8 (WEStern 5651).

Duscon Engineering Ltd., Union Works, Union Lane, Droitwich, Worcestershire (Droitwich 2027/8). ("*Duspak*" *fabric filters.*)

Harrington, C. H. & Co. Ltd., 38/40 Howard Street and 15/17 Howard Lane, Sheffield, 1 (Sheffield 28537).

Heather Filters Limited, 7 Kendall Place, Baker Street, London, W.1 (HUNter 1801). (*Multi-brush*).

Howorth, James & Co. Ltd., Victoria Works, Farnworth, near Bolton, Lancashire (Farnworth 1060-1).
Southern Office: Air Process Units Ltd., Cromwell Road, Camberley, Surrey (Camberley 25071).

Jukes, Frederick Ltd., Royston Works, Redditch Road, Stoke Heath, Bromsgrove, Worcestershire (Bromsgrove 3344).

Locker Industries (Sales) Ltd., Church Street, Warrington, Lancashire (Warrington 34111).
London Office: Clune House, 17 Surrey Street, Strand, London, W.C.2 (TEMple Bar 8559).

Machine Control Ltd., Blatchford Road, Horsham, Sussex (Horsham 3215). ("*Emcel*" *air filters.*)

Matthews & Yates Ltd., Cyclone Works, Swinton, Manchester (Swinton 2273).

Nailsea Engineering Co. Ltd., Samlesbury Airfield, near Blackburn, Lancashire (Mellor 666). ("*Pnu-jet*" *reverse jet filters.*)

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233). (*Electrostatic, viscous and fabric.*)

Tilghmans Ltd., Broadheath, Altrincham, Cheshire (Altrincham 4242) (9 lines) (*Electrostatic and ultrafiltration.*)

Visco Ltd., Stafford Road, Croydon, Surrey (MUNicipal 3861) (10 lines).

Western Precipitation Division, Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711). ("*Thermoflex*" *high temperature filters.*)

FIRE LIGHTERS (ELECTRIC)

Best Products Ltd., Ranelagh House, Felixstowe, Suffolk (Felixstowe 3154/5/6). ("*Matchless*" *electric firelighter.*)

FIRE-LIGHTERS (GAS)

Baxi, Richard Baxendale & Sons, Bamber Bridge, Preston, Lancashire (Preston 35271).

FLOOR HEATING

James, Richard (Westminster) Ltd., Ferry Works, Lacy Road, Putney, London, S.W.15 (PUTney 7792). (*Embedded hot water systems.*)

FLUE ASH AND CLINKER CONVEYING PLANT

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321).
Winchester House, Victoria Square, Birmingham, 2 (Midland 6741).
145 St. Vincent Street, Glasgow, C.2 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 4908).
Norfolk House, Grey Street, Newcastle-upon-Tyne (29212).
Aylward House, Wine Street, Bristol, 1 (294561).

British Vacuum Cleaner & Engineering Co. Ltd., Goblin Works, Leatherhead, Surrey (Ashtead 6121).

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233).

Thompson, John (Triumph), Ltd., Triumph Works, Kirkstall Road, Leeds, 3 (Leeds 34841). ("*Triumph*" *Stokers.*)

FLUE DUST EXTRACTION PLANT

Buell Ltd., 8-10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761).
Imperial Steel Works, Sheffield, 9 (Sheffield 49054).

Collectron Ltd., 32 Aylmer Road, Leytonstone, London, E.11 (LEYtonstone 3085/4709).
3 Brook Square, Rugeley, Staffordshire (Rugeley 659).

Davidson & Co. Ltd., Sirocco Engineering Works, Belfast, 5, Northern Ireland (Belfast 57251). ("*Sirocco*".)

Musgrave & Co. Ltd., St. Ann's Works, Belfast, 5 (Belfast 59411) (8 lines).
46-50 Coombe Road, New Malden, Surrey (MALden 9241).

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233) (*Pneumatic.*)

FLUE GAS DUST MONITORING DEVICE (C.E.G.B. TYPE)

Airflow Developments Ltd., Lancaster Road, High Wycombe, Bucks. (High Wycombe 5252/4).

FLUE GAS DUST SAMPLING EQUIPMENT (B.C.U.R.A. TYPE)

Airflow Developments Ltd., Lancaster Road, High Wycombe, Bucks. (High Wycombe 5252/4).

FLUE GAS TREATMENT

D.C.P. Systems Ltd., Centre Heights, 137 Finchley Road, London, N.W.3 (JUNiper 1121).

FLUE HEATERS, BALANCED

Borchardt, F. A. Ltd., Mill Lane, Old Swan, Liverpool, 13 (Stoneycroft 4757).
486 High Road, Chiswick, London, W.4 (CHIswick 0840). ("*DRUgasar*" *balanced flue gas heater.*)

FUEL EFFICIENCY ADVISORY SERVICE

British Coking Industry Association, 74 Grosvenor Street, London, W.1 (MAYfair 9736).

National Industrial Fuel Efficiency Service, The, 71 Grosvenor Street, London, W.1 (HYDe Park 9706).

FUEL OIL STORAGE TANKS (MILD STEEL)

Binner, T. G. (Boilers) Ltd., New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

Reeve, E. G. & Sons Ltd., Burton Road, St. Faith's Industrial Estate, Norwich, Norfolk (NOR.84.N) (Norwich 47228/9/0).

FUEL OIL STORAGE TANKS (REINFORCED CONCRETE)

Borsari & Co., Zollikon-Zurich, Switzerland (24 96 18). (*Tile-lined underground tanks of reinforced concrete.*)

FUME REMOVAL EQUIPMENT

Ambuco Ltd., 49 Moorgate, London, E.C.2 (METropolitan 9242/4).
Dron & Dickson Ltd., 158 Bath Street, Glasgow, C.2 (Douglas 1337). (*Ambuco cyclones, scrubbers and fabric arresters*).

Bell Bros. (Pudsey) Ltd., Green Lane, Smalewell Road, Pudsey, Yorkshire (Pudsey 5715/6).

Chemical Construction (G.B.) Ltd., Regal House, Twickenham, Middlesex (POPesgrove 4455). ("*Chemico*"*—Pease Anthony Venturi scrubbers*).

Constant Air Systems Ltd., Shaftesbury House, Northolt Road, Harrow, Middlesex (CONcord 0288).

Drummond Dust & Fume Extractors Ltd., Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (LARkswood 4441). ("*Drummond*" *dust and fume extractors.*)

Duscon Engineering Ltd., Union Works, Union Lane, Droitwich, Worcestershire (Droitwich 2027/8).

Fan Systems Ltd., 2 Brazil Street, Manchester, 1 (Central 7156/7/8). (*Fans and ancillary equipment.*)

Harrington, C. H. & Co. Ltd., 38/40 Howard Street and 15/17 Howard Lane, Sheffield, 1. (Sheffield 28537).

Head Wrightson Iron & Steel Works Engineering Ltd., Teesdale Ironworks, Thornaby-on-Tees, Co. Durham (Stockton 62241).

Jukes, Frederick Ltd., Royston Works, Redditch Road, Stoke Heath, Bromsgrove, Worcestershire (Bromsgrove 3344).

Kavag, Gondsroth/Hessen, 6461, West Germany.
U.K. Office: Somerset House, George Street, Halifax, Yorkshire (Halifax 65109). (*Catalytic combustion equipment.*)

Marshall & Parsons Ltd., 1111 London Road, Leigh-on-Sea, Essex (Southend 74867). ("*Draught-Master*" *automatic one-way air inlet;* "*Flue-Master*" *automatic one-way air intake.*)

Matthews & Yates Ltd., Cyclone Works, Swinton, Manchester (Swinton 2273).

Morgan Air Treatments Ltd., 55/57 Salop Street, Birmingham, 12 (Victoria 2096).

Musgrave & Co. Ltd., St. Ann's Works, Belfast, 5 (Belfast 59411) (8 lines).
46-50 Coombe Road, New Malden, Surrey (Malden 9241).

Newton Collins Ltd., Barford Street Works, Birmingham, 5 (Midland 3670). ("*Dustrol*").

Richardson, R. J. & Sons Ltd., Engineering and Shotblast Works, 37 Commercial Street, Birmingham, 1 (Midland 2281 PBX). (*High temperature, high efficiency dust and fume extraction and filtration, normal dust extraction and collection, electrostatic precipitation, super cleaning of atmosphere air.*)

Spencer & Halstead Ltd., Bridge Works, Ossett, Yorkshire (Ossett 821). ("*Spenstead.*")

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233). (*Electrostatic precipitators, scrubbers, fabric filters.*

Visco Ltd., Stafford Road, Croydon, Surrey (MUNicipal 3861) (10 lines).

Western Precipitation Division, Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711).

Wright & Summerhill Ltd., Lupton Street, Leeds, 10 (Leeds 75434/5). (*Sheet metal, ventilating and light constructional engineers,* "*Ventwright*" *canopies, incorporating fans, filters, grilles, louvres, etc.*)

FURNACES, KILNS, OVENS ETC.

Catterson-Smith Ltd., Adams Bridge Works, Exhibition Grounds, Wembley, Middlesex (Wembley 4291). (*Electric furnaces and ovens.*)

Heat Economy Ltd., 13 Kentish Town Road, London, N.W.1 (GULliver 1233/2512).

Radiant-Heating Ltd., 475 Foleshill Road, Coventry (Coventry 88655). (*Special furnaces.*)

Rider, G. F. (Process Plant) Ltd., 59-61 Tollington Park, London, N.4 (ARChway 0404).

GAS CLEANING PLANT

Head Wrightson Iron & Steel Works Engineering Ltd., Teesdale Ironworks, Thornaby-on-Tees, Co. Durham (Stockton 62241).

Lodge-Cottrell Ltd., George Street Parade, Birmingham, 3 (Central 3388). (*Electrical precipitation.*)

Musgrave & Co. Ltd., St. Ann's Works, Belfast. 5 (Belfast 59411) (8 lines).
46-50 Coombe Road, New Malden, Surrey (Malden 9241).

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233). (*Electrostatic precipitators, scrubbers, mechanical collectors, fabric filters.*)

GAS HEATING EQUIPMENT

Air Heaters (Colchester) Ltd., 66 Barrack Street, Colchester, Essex (Colchester 78484).

Borchardt, F. A. Ltd., Mill Lane, Old Swan, Liverpool, 13 (Stoneycroft 4757).
486 High Road, Chiswick, London, W.4 (CHIswick 0840). ("*DRUgasar*" *balanced flue gas heater.*)

Potterton, Thomas Ltd., 20/30 Buckhold Road, London, S.W.18 (VANdyke 7202). ("*Potterton*" *and* "*Diplomat*".)

Radiant-Heating Ltd., 475 Foleshill Road, Coventry (Coventry 88655).

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

GAS HEATING EQUIPMENT (BUTANE/PROPANE)

Air Heaters (Colchester) Ltd., 66 Barrack Street, Colchester, Essex (Colchester 78484).

Borchardt, F. A. Ltd., Mill Lane, Old Swan, Liverpool, 13 (Stoneycroft 4757).
486 High Road, Chiswick, London, W.4 (CHIswick 0840). (*"DRUgasar" balanced flue gas heater.*)

Radiant-Heating Ltd., 475 Foleshill Road, Coventry (Coventry 88655).

GAS SCRUBBERS AND WASHERS

Chemical Construction (G.B.) Ltd., Regal House, Twickenham, Middlesex (POPesgrove 4455). (*"Chemico"—Pease Anthony Venturi scrubbers.*)

Drummond Dust & Fume Extractors Ltd., Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (LARkswood 4441).

Head Wrightson Iron & Steel Works Engineering Ltd., Teesdale Ironworks, Thornaby-on-Tees, Co. Durham (Stockton 62241).

Western Precipitation Division, Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711). (*"Joy Microdyne" scrubbers and "Turbulaire" scrubbers.*)

GAS SUPPLY (MAINS)

Gas Council, The, 4-5 Grosvenor Place, London, S.W.1 (BELgravia 4321).
Scottish Gas Board, 26 Drumsheugh Gardens, Edinburgh, 3 (Caledonian 2052/7).
Northern Gas Board, 30 Grainger Street, Newcastle-upon-Tyne (26101).
North Western Gas Board, Whelman House, Altrincham, Cheshire (Altrincham 6311).
North Eastern Gas Board, New York Road, Leeds (32691).
East Midlands Gas Board, De Montfort Street, Leicester (50022).
West Midlands Gas Board, Wharf Lane, Solihull, Warwickshire (Solihull 6888).
Wales Gas Board, Snelling House, Bute Terrace, Cardiff (Cardiff 33131).
Eastern Gas Board, Sun Building, Clarendon Road, Watford (28555).
North Thames Gas Board, 30 Kensington Church Street, London, W.8 (WEStern 8141).
South Eastern Gas Board, Katharine Street, Croydon, Surrey (4466).
Southern Gas Board, 164 Above Bar, Southampton (Southampton 75544).
South Western Gas Board, 9a Quiet Street, Bath (60411).

GRILLES, LOUVRES, ETC.

Air Distribution Equipment Ltd., Bentinck Road, West Drayton, Middlesex (West Drayton 2687). (*"Titus" aluminium grilles, louvres, etc.*)

GRIT ARRESTERS

Alldays & Onions Ltd., P.O. Box 234, Great Western Works, Sydenham Road, Birmingham, 11 (Victoria 2251/4).

Ambuco Ltd., 49 Moorgate, London, E.C.2 (METropolitan 9242/4).
Dron & Dickson Ltd., 158 Bath Street, Glasgow, C.2 (Douglas 1337). (*Ambuco cyclones, scrubbers and fabric arresters.*)

Bigwood, Joshua & Son Ltd., Wednesfield Road, Wolverhampton (Wolverhampton 24771).

Buell Ltd., 8-10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761).
Imperial Steel Works, Sheffield, 9 (Sheffield 49054).

Collectron Ltd., 32 Aylmer Road, Leytonstone, London, E.11 (LEYtonstone 3085 & 4709).
3 Brook Square, Rugeley, Staffordshire. (Rugeley 659). (*"Collectron" grit arresters.*)

Combustion Equipment Ltd., 322 St. John Street, London, E.C.1 (BRUnswick 7785/6). (*Cory grit arresters, aluminium cladding for chimneys; Dribore chimneys; furnace baffle for shell boilers; waste material disposal furnaces.*)

unford & Elliott Process Engineering Ltd., 43 Maple Road, Surbiton, Surrey (KINgston 799). (*Dust control and collection systems*).

airitt Engineering (Sales) Ltd., 101 Sandford oad, Moseley, Birmingham 13 (SOUth 651).
ales Office: 24 Worple Road, Wimbledon, ondon, S.W.19 (LAKeside 1540).

an Systems Ltd., 2 Brazil Street, Manhester, 1 (Central 7156/7/8). (*Fans and ncillary equipment.*)

leat Economy Ltd., 13 Kentish Town Road, ondon, N.W.1 (GULliver 1233/2512).

ncinerator Co. Ltd. (The), 14 Cooper's ow, Tower Hill, London, E.C.3 (ROYal 931—5 lines). (*Scrubber type.*)

lusgrave & Co. Ltd., St. Ann's Works, elfast, 5 (Belfast 59411) (8 lines).
6-50 Coombe Road, New Malden, Surrey Malden 9241).

odway & Taylor (Birmingham) Ltd., 85-90 uckingham Street, Birmingham, 19 (Central 027-8). (*Dust, fume, ventilating and heating ngineers.*)

turtevant Engineering Co. Ltd., Sturtevant louse, Highgate Hill, London, N.19 ARChway 0233). (*Electrostatic precipitators, nechanical collectors, scrubbers, fabric lters.*)

ipton Tub & Tube Co. Ltd., Bloomfield oad, Tipton, Staffordshire (Tipton 1011/ 418).

Vellman Incandescent Furnace Co. Ltd., ornwall Road, Smethwick 40, Staffordshire Smethwick 2121). (*Incandescent-Whiting ust Collectors for cupolas.*)

HEAT EXCHANGERS

.T.C. (Heat) London Ltd., 17 Sloane Street, ondon, S.W.1 (BELgravia 3478/6286).

HEATERS, AIR

Air Heaters (Colchester) Ltd., 66 Barrack treet, Colchester, Essex (Colchester 78484).

Clyde Fuel Systems Ltd., Queen Elizabeth Avenue, Hillington, Glasgow, S.W.2 (Halfway 3291) (8 lines).

Hainault Engineering Co. Ltd., Fowler Road, Hainault, Essex (Hainault 4426/8).
21 Evesham Avenue, Whitley Bay, Northumberland (20588). (*Hainault industrial oil-fired air heaters.*)

Matthews & Yates Ltd., Cyclone Works, Swinton, Manchester (Swinton 2273).

Radiation Parkray Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

Wanson Co. Ltd., 7 Elstree Way, Borehamwood, Herts. (Elstree 5696). ("*Thermobloc*" *direct-fired air heaters.*)

HEATERS, ELECTRIC (FUEL EFFECT)

Dimplex Ltd., Millbrook, Southampton, Hampshire (Southampton 74425/9).

HEATERS, INFRA-RED

Dimplex Ltd., Millbrook, Southampton, Hampshire (Southampton 74425/9).

Kavag, Gondsroth/Hessen, 6461, West Germany.
U.K. Office: Somerset House, George Street, Halifax, Yorkshire (Halifax 65109).

HEATERS, LIQUID PHASE

Stone J. & Co. (Deptford) Ltd., Stone-Vapor Boiler Division, Arklow Road, London, S.E.14 (TIDeway 1202). ("*Stone-Vapor*".)

HEATERS, WATER

Lathe, Charles & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffs. (Tipton 1887). ("*Claco*" *solid fuel burning appliances.*)

Radiation Parkray Ltd., Radiation House, North Circular Road, London, N.W.10 WILlesden 1234).

Spanner Boilers Ltd., Wokingham Road, Bracknell, Berkshire (Bracknell 1500).

HEATING EQUIPMENT, DOMESTIC

Baxi, Richard Baxendale & Sons, Bamber Bridge, Preston, Lancashire (Preston 35271). (*"Baxi." patent under-floor draught fire, open fire and gas warm air central heating systems.*)

Borchardt, F. A. Ltd., Mill Lane, Old Swan, Liverpool, 13 (Stoneycroft 4757).
486 High Road, Chiswick, London, W.4 (CHIswick 0840).

British Coking Industry Association, 74 Grosvenor Street, London, W.1 (MAYfair 9736). ("*Sunbrite*" *solid fuel*).

BM Controls, 36 Kingston Road, Staines, Middlesex (Staines 51166). ("*BM*" *oil control valves, oil lifters, etc.*)

Dimplex Ltd., Millbrook, Southampton, Hampshire (Southampton 74425/9).

Ekco Heating & Electrical Ltd., 41/47 Old Street, London, E.C.2 (CLErkenwell 7142).

Grahamston Iron Co. Ltd., P.O. Box No. 5, Grahamston Iron Works, Falkirk, Stirlingshire (Falkirk 22661). (*Continuous burning inset open fires, underfloor draught fires, room heaters and convector heaters.*)

Lathe, Charles & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffs. (Tipton 1887). ("*Claco*" *solid fuel burning appliances.*)

Lesser, David C., & Co. Ltd., 10 Balaclava Road, King's Heath, Birmingham, 14 (Highbury 5435). ("*Lestric*" *and* "*Priory*" *electric fires, fan heaters, towel rails.*)

Potterton, Thomas Ltd., 20/30 Buckhold Road, London, S.W.18 (VANdyke 7202). ("*Potterton*" *gas and oil-fired, &* "*Diplomat*" *oil-fired.*)

Radiation Central Heating Ltd., Radiation House, North Circular Road, London, N.W.10. (WILlesden 1234).

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

Radiation Parkray Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

HEATING EQUIPMENT, INDUSTRIAL (PROCESS)

Air Heaters (Colchester) Ltd., 66 Barrack Street, Colchester, Essex (Colchester 78484).

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321). ("*Babcock*".)
Winchester House, Victoria Square, Birmingham, 2 (Midland 6741).
145 St. Vincent Street, Glasgow, C.2 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 4908).
Norfolk House, Grey Street, Newcastle-upon-Tyne (29212).
Aylward House, Wine Street, Bristol, 1 (294561).

Catterson-Smith, R. M. Ltd., Adams Bridge Works, Exhibition Grounds, Wembley, Middlesex (Wembley 4291). (*Electric furnaces and ovens.*)

Clyde Fuel Systems Ltd., Queen Elizabeth Avenue, Hillington, Glasgow, S.W.2 (Halfway 3291) (8 lines).

Isopad Ltd., Barnet-By-Pass, Boreham Wood, Herts. (Elstree 2817-18-19-10).

Kavag, Gondsroth/Hessen, 6461, West Germany.
U.K. Office: Somerset House, George Street, Halifax, Yorkshire (Halifax 65109).

Radiant-Heating Ltd., 475 Foleshill Road, Coventry (Coventry 88655).

Spencer & Halstead Ltd., Bridge Works, Ossett, Yorkshire (Ossett 821). ("*Spenstead.*")

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233). (*High pressure hot water.*)

HEATING EQUIPMENT, INDUSTRIAL (SPACE)

Air Heaters (Colchester) Ltd., 66 Barrack Street, Colchester, Essex (Colchester 78484).

Bering Engineering Ltd., Doman Road, Camberley, Surrey (Camberley 4191) (7 lines).

Borsari & Co., Zollikon-Zurich, Switzerland (24 96 18).

Borchardt, F. A. Ltd., Mill Lane, Old Swan, Liverpool, 13 (Stoneycroft 4757).
486 High Road, Chiswick, London, W.4 (CHIswick 0840).

Carrier-Ross Engineering Co. Ltd., 22a Cavendish Square, London, W.1 (MAYfair 2364/6).

Clyde Fuel Systems Ltd., Queen Elizabeth Avenue, Hillington, Glasgow, S.W.2 (Halfway 3291) (8 lines).

Ekco Heating & Electrical Ltd., 41/47 Old Street, London, E.C.2 (CLErkenwell 7142).

Howorth, James & Co. Ltd., Victoria Works, Farnworth, near Bolton, Lancashire (Farnworth 1060/1).
Southern Office: Air Process Units Ltd., Cromwell Road, Camberley, Surrey (Camberley 25071).

Matthews & Yates Ltd., Cyclone Works, Swinton, Manchester (Swinton 2273).

Morgan Air Treatments Ltd., 55/57 Salop Street, Birmingham, 12 (VICtoria 2096). ("*Morganair*".)

Potterton, Thomas Ltd., 20/30 Buckhold Road, London, S.W.18 (VANdyke 7202). ("*Potterton*" *and* "*Diplomat*".)

Radiant-Heating Ltd., 475 Foleshill Road, Coventry (Coventry 88655).

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

Spanner Boilers Ltd., Wokingham Road, Bracknell, Berkshire (Bracknell 1500).

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233). (*Plenum, Radiant, high and medium pressure hot water.*)

Wanson Co. Ltd., 7 Elstree Way, Borehamwood, Herts. (ELStree 5696). ("*Thermobloc*" *direct-fired air heaters.*)

HEATING SYSTEMS—OIL

Air Heaters (Colchester) Ltd., 66 Barrack Street, Colchester, Essex (Colchester 78484).

Ford, John, Engineering (Plymouth) Ltd., Hillcrest Works, Oakfield Terrace Road, Cattedown, Plymouth, South Devon (Plymouth 63351/2).

Norris Warming Co. Ltd., Burley House, 5/11 Theobald's Road, London, W.C.1 (HOLborn 7833).
62/63 Lionel Street, Birmingham, 3 (Central 0981).
2/3 Melrose Avenue, Clifton, 8 (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 16 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 28037).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).
38/40 Elm Grove, Portsmouth (Portsmouth 25551/2).
5/6 Claremont Terrace, Glasgow, C.3 (Douglas 5901/2).

Shell-Mex and B.P. Ltd., Shell-Mex House, Strand, London, W.C.2 (TEMple Bar 1234).

HEATING TAPES (ELECTRIC)

Isopad Ltd., Barnet-by-Pass, Boreham-wood, Herts (ELStree 2817-18-19-10).

HUMIDIFIERS

American Moistening Co. Ltd., Cheapside Chambers, Bradford, 1 (Bradford 21906). ("*Amco*" *atomizers, dry duct systems.*)

Carrier Engineering Co. Ltd., Carrier House, Warwick Row, London, S.W.1 (VICtoria 6858).

Heather Filters Limited, 7 Kendall Place, Baker Street. London, W.1 (HUNter 1801). ("*Satomair*")

Howorth, James & Co. Ltd., Victoria Works, Farnworth, near Bolton, Lancashire (Farnworth 1060/1).
Southern Office: Air Process Units Ltd., Cromwell Road, Camberley, Surrey (Camberley 25071).

Spencer & Halstead Ltd., Bridge Works, Ossett, Yorkshire (Ossett 821) ("*Spenstead.*")

INCINERATORS

Bering Engineering Ltd., Doman Road, Camberley, Surrey (Camberley 4191) (7 lines). ("*Kleenaire*" *smokeless incinerators.*)

Gibbons Askam Ltd., P.O. Box No. 19, Dibdale, Dudley, Worcestershire (Dudley 55141/55208). (*Cremating furnaces, incinerators, pottery kilns, etc.*)

Heenan & Froude Ltd., Shrub Hill, Worcester (Worcester 23461) (14 lines).

Incinerator Co. Ltd. (The), 14 Cooper's Row, Tower Hill, London, E.C.3 (ROYal 9931—5 lines). (*Incinerators for all industrial and municipal wastes, cremators for animal wastes, after-burning units for furnaces of all types.*)

McDowell, Thomas Ltd., Zone Incinerators, R.C.M. Works, South Way, Wembley, Middlesex (Wembley 5212). ("*Zone*" *smokeless incinerators.*)

Radiant-Heating Ltd., 475 Foleshill Road, Coventry, (Coventry 88655). (*gas.*)

Rider, G. F. (Process Plant) Ltd., 59-61 Tollington Park, London, N.4 (ARChway 0404).

Riley (IC) Products Ltd., 19 Woburn Place, London, W.C.1 (TERminus 2622). (*Oil burners, mechanical stokers, and incinerators.*)

Universal Machinery & Services Ltd., Viceroy Works, Low Fields Road, Leeds, 12 (Leeds 34261-3). ("*Boston*" *smokeless and* "*Universal*" *sealed-flame disposal units.*)

Vauxhall Boiler Co. Ltd., Banbury, Oxfordshire (Banbury 3437). ("*Series Flow*" *and Vauxhall Joseph Goder incinerators.*)

Victor Products (Wallsend) Ltd., G.P.O. Box 10, Wallsend, Northumberland (Wallsend 628331).
1327, London Road, Norbury, London, S.W.16 (POLlards 0077).
Victoria Chambers, Dale Road, Matlock, Derbyshire (Matlock 3059) ("*Victor*").

INSTRUMENTS, GAUGES, METERS, ETC.

Casella, C. F. & Co. Ltd., Regent House, Britannia Walk, London, N.1 (CLErkenwell 8581/7). (*Scientific and meteorological instruments.*)

Elliott Process Automation Ltd., Abbey Road, Park Royal, London, N.W.10 (ELGar 8811).

U.G.I. (Meters) Ltd., 170 Rowan Road, Streatham Vale, London, S.W.16 (POLlards 2271/5). (*Air pollution meter.*)

LECTURE NOTES, SLIDES AND FILMSTRIPS

National Society for Clean Air, Field House, Breams Buildings, London, E.C.4 (CHancery 5038). ("*Clean Air*" *notes for teachers and lecturers,* 1*s.* 6*d.*, *leaflets, slides.*)

Wyllie, Diana Ltd., 3 Park Road, Baker Street, London, N.W.1 (PADdington 7333). (*Colour filmstrips and lecture notes on air pollution, chronic bronchitis, safety and oil heaters, etc.*)

PHOTOGRAPHS

Dong, Paul, M.J.I., 20 Freshford Street, Earlsfield, London, S.W.18 (WIMbledon 9766). (*Press, industrial and exhibition photographer—official photographer for National Society for Clean Air Conference and Exhibition,* 1963 *and* 1964.)

PUMPS

Austen Pumps, Charles Ltd., Petersham Works, 100 Royston Road, Byfleet, Surrey (Byfleet 43224/5). ("*Dymax*".)

RADIANT HEATING

Dimplex Ltd., Millbrook, Southampton, Hampshire (Southampton 74425/9).

Ekco Heating & Electrical Ltd., 41/47 Old Street, London, E.C.2 (CLErkenwell 7142).

James, Richard (Westminster) Ltd., Ferry Works, Lacy Road, Putney, London, S.W.15 (PUTney 7792). (*Embedded hot water floor and ceiling systems, radiant panel systems and Plasrib hot water heated acoustic ceilings.*)

Lesser, David C. & Co. Ltd., 10 Balaclava Road, King's Heath, Birmingham, 14 (Highbury 5435). ("*Lestric*" *and* "*Priory*" *electric fires, fan heaters, towel rails.*)

Magni Reflector Co. Ltd., 10 Market Road, Chichester, Sussex (Chichester 3279). (*The Magni heat reflector chimney throat unit.*)

Radiant-Heating Ltd., 475 Foleshill Road, Coventry, (Coventry 88655).

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

Radiation Parkray Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

RADIATORS

Dimplex Ltd., Millbrook, Southampton, Hampshire (Southampton 74425/9).

Potterton, Thomas, Ltd., 20/30 Buckhold Road, London, S.W.18 (VANdyke 7202).

Wilson, Henry & Co. Ltd., P.O. Box No. 6, Kirkby Industrial Estate, near Liverpool, Lancashire (Simonswood 3541) (9 lines). (*Wilson* "*Straightline*" *and* "*Waveline*" *steel panel radiators.*)

REFRIGERATION PLANT

Bass, John, Ltd., B.M.B. Crawley Works, Fleming Way, Crawley, Sussex (Crawley 28765) (9 lines).

Carrier Engineering Co. Ltd., Carrier House, Warwick Row, London, S.W.1 (VICtoria 5858).

Lightfoot Refrigeration Co. Ltd., The, Abbeydale Road, Wembley, Middlesex (PERivale 3322).

RESEARCH & DEVELOPMENT FACILITIES

British Non-Ferrous Metals Research Association, Euston Street, London, N.W.1 (EUSton 6411).

Head Wrightson Iron & Steel Works Engineering Ltd., Teesdale Ironworks, Thornaby-on-Tees, Co. Durham (Stockton 62241).

ROOM HEATERS, ELECTRIC

Dimplex Ltd., Millbrook, Southampton, Hampshire (Southampton 74425/9).

Ekco Heating & Electrical Ltd., 41/47 Old Street, London, E.C.2 (CLErkenwell 7142).

Lesser, David C. & Co. Ltd., 10 Balaclava Road, King's Heath, Birmingham, 14 (Highbury 5435). ("*Lestric*" *and* "*Priory*" *fires, fan heaters, towel rails.*)

ROOM HEATERS, GAS

Allied Ironfounders Ltd., 28 Brook Street, London, W.1. (Grosvenor 8941).
Sales Office: Cadbury Road, Sunbury-on-Thames, Middx. Sunbury (S.M.8) 5577.
(*Aga Domestic Boilers, Allied Industrial Boilers, Rayburn Room Heaters.*)

Cannon Industries Ltd., Deepfields, Bilston, Staffordshire (Bilston 41241).
4 Old Park Lane, London, W.1 (HYDe Park 4861).
Showrooms: 202B Kensington High Street, London, W.8 (WEStern 0122).

ROOM HEATERS, SOLID FUEL

Allied Ironfounders Ltd., 28 Brook Street, London, W.1. (Grosvenor 8941).
Sales Office: Cadbury Road, Sunbury-on-Thames, Middx. Sunbury (S.M.8) 5577.
(*Aga Domestic Boilers, Allied Industrial Boilers, Rayburn Room Heaters.*)

ROOM HEATERS, SOLID FUEL (OPEN FIRES)

Baxi, Richard Baxendale & Sons, Bamber Bridge, Preston, Lancashire (Preston 35271). ("*Baxi*" *patent under-floor draught fire.*)

Haighton, Richard, Ltd., Canning Street, Burnley, Lancashire (Burnley 5206/7). ("*Lo-fire*".)

Jones & Campbell Ltd., Torwood Foundry, Larbert, Stirlingshire (Larbert 2114) (4 lines). ("*Tor*" *heaters.*)

Lathe, Charles & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffordshire (Tipton 1887). ("*Claco*" *solid fuel burning appliances.*)

Radiation Parkray Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

ROOM HEATERS, SOLID FUEL (OPENABLE STOVES)

Haighton, Richard, Ltd., Canning Street, Burnley, Lancashire (Burnley 5206/7). ("*Lo-fire*".)

Jones & Campbell Ltd., Torwood Foundry, Larbert, Stirlingshire (Larbert 2114) (4 lines). ("*Tor*" *stoves.*)

Radiation Parkray Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

Webb, R. E., M.R.P.H., 71A Garden Walk, Cambridge (Cambridge 58558).

SMOKE DENSITY METERS

Elliott Process Automation Ltd., Abbey Road, Park Royal, London, N.W.10 (ELGar 8811).

Foster Instrument Co. Ltd., Letchworth, Hertfordshire (Letchworth 2201).

SMOKE INDICATORS

Lancashire Dynamo Electronic Products Ltd. (M.I. Group), Rugeley, Staffordshire (Rugeley 371). (*Industrial electronic control equipment.*)

Radiovisor Parent Ltd., Stanhope Works, High Path, London, S.W.19 (CHErrywood 3351).

Ronald Trist Controls Ltd., Bath Road, Slough, Bucks (Slough 25041). (*Electricon smoke density indicators and alarms.*)

SMOKELESS FUEL, OIL

Shell-Mex and B.P. Ltd., Shell-Mex House, Strand, London, W.C.2 (TEMple Bar 1234).

SMOKELESS FUELS, SOLID

British Coking Industry Association, 74 Grosvenor Street, London, W.1 (MAYfair 9736). ("*Sunbrite.*")

Coalite and Chemical Products Ltd., P.O. Box No. 21, Chesterfield, Derbyshire (Bolsover 2281).
103 Mount Street, London, W.1 (GROsvenor 7931). ("*Coalite*" *smokeless coal.*)

National Carbonising Co. Ltd., Thorney House, 34 Smith Square, London, S.W.1 (ABBey 7331).
Fullarton Lodge, Crowhill Drive, Mansfield, Nottinghamshire (Mansfield 2357). ("*Rexco*" *smokeless coal.*)

National Coal Board, Hobart House, Grosvenor Place, London, S.W.1 (BELgravia 2020). ("*Sunbrite*", "*Phurnacite*", "*Homefire*", "*Roomheat,*" *and* "*Phurnacine.*")

Solid Smokeless Fuels Federation, 74 Grosvenor Street, London, W.1 (MAYfair 3327/28). (*Advisory service.*)

STOKERS, INDUSTRIAL

Alison, J. Gordon & Co. Ltd., Dock Engine Works, Birkenhead, Cheshire (Birkenhead 8052). ("*Simplex*" *mechanical feed unit for wood refuse.*)

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321).
Winchester House, Victoria Square, Birmingham, 2 (Midland 6741).
145 St. Vincent Street, Glasgow, C.2 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 4908).
Norfolk House, Grey Street, Newcastle-upon-Tyne (29212).
Aylward House, Wine Street, Bristol, 1 (294561).

Clyde Fuel Systems Ltd., Queen Elizabeth Avenue, Hillington, Glasgow, S.W.2 (Halfway 3291) (8 lines).

Crosthwaite Furnaces & Scriven Machine Tools Ltd., York Street Ironworks, Leeds, 9 (Leeds 32411-2). ("*Crosthwaite.*")

Danks, Edwin & Co. (Oldbury) Ltd., P.O. Box No. 4, Oldbury, Birmingham (Broadwell 2531) (9 lines).

Proctor, James, Ltd., P.O. Box No. 19, Hammerton Street, Burnley, Lancashire (Burnley 3102).

Riley (IC) Products Ltd., 19 Woburn Place, London, W.C.1 (TERminus 2622). (*Oil burners, mechanical stokers, incinerators.*)

Thompson, John (Triumph) Ltd., Triumph Works, Kirkstall Road, Leeds, 3 (Leeds 4841). ("*Triumph*" *stokers.*)

STOVES, ANTHRACITE

Pithers Radiant Stoves Ltd., 34-38 Mortimer Street, London, W.1 (MUSeum 2089 and 5573). (*Pithers Radiant stoves.*)

THERMOMETERS, INDICATORS, ETC.

Casella, C. F., & Co. Ltd., Regent House, Britannia Walk, London, N.1 (CLErkenwell 8581). (*Scientific and meteorological instruments.*)

THERMOSTATS

Ekco Heating & Electrical Ltd., 41/47 Old Street, London, E.C.2 (CLErkenwell 7142).

VENTILATORS

Marshall & Parsons Ltd., 1111 London Road, Leigh-on-Sea, Essex (Southend 74867). ("*Draught-Master*" *automatic one way air inlet;* "*Flue-Master*" *automatic one way air intake.*)

Morgan Air Treatments Ltd., 55/57 Salop Street, Birmingham, 12 (Victoria 2096).

WARM AIR HEATING SYSTEMS

Bibbey, A. H. (Sales) Ltd., High Wych, Sawbridgeworth, Hertfordshire (Sawbridgeworth 2050/3406). ("*Husqvarna*".)

Constant Air Systems Ltd., Shaftesbury House, Northolt Road, Harrow, Middlesex (CONcord 0288).

Ford, John, Engineers (Plymouth) Ltd., Hillcrest Works, Oakfield Terrace Road, Cattedown, Plymouth, South Devon (Plymouth 63351/2).

Morgan Air Treatments Ltd., 55/57 Salop Street, Birmingham, 12 (VICtoria 2096). ("*Morganair*".)

Norris Warming Co. Ltd., Burley House, 5/11 Theobald's Road, London, W.C.1 (HOLborn 7833).
62/63 Lionel Street, Birmingham, 3 (Central 0981).
2/3 Melrose Avenue, Clifton, 8 (Bristol 30261/8).
Norris House, 611 Stretford Road, Manchester, 16 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 28037).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).
38/40 Elm Grove, Portsmouth (Portsmouth 25551/2).
5/6 Claremont Terrace, Glasgow, C.3 (Douglas 5901/2).

WASTE FUEL BOILER PLANT

Incinerator Co. Ltd. (The), 14 Cooper's Row, Tower Hill, London, E.C.3 (ROYal 9931—5 lines). (*After-burning units for furnaces of all types.*)

Rider, G. F. (Process Plant) Ltd., 59-61 Tollington Park, London, N.4. (ARChway 0404).

WASTE HEAT RECOVERY

Heenan & Froude Ltd., Shrub Hill, Worcester (Worcester 23461) (14 lines).

Spanner Boilers Ltd., Wokingham Road, Bracknell, Berkshire (Bracknell 1500).

WASTE MATERIAL DISPOSAL FURNACES

Combustion Equipment Ltd., 322 St. John Street, London, E.C.1 (BRUnswick 7785/6). (*Cory Grit arresters, aluminium cladding for chimneys, Dribore chimneys, furnace baffle for shell boilers, waste material disposal furnaces.*)

Incinerator Co. Ltd. (The), 14 Cooper's Row, Tower Hill, London, E.C.3 (ROYal 9931—5 lines). (*Incinerators for all industrial and municipal wastes, after-burning units for furnaces of all types.*)

WASTE MATERIAL FEED UNITS

Alison, J. Gordon & Co. Ltd., Dock Engine Works, Birkenhead, Cheshire (Birkenhead 8052). ("*Simplex*" *mechanical feed unit for wood refuse.*)

WET ARRESTERS

Bigwood, Joshua & Son Ltd., Wednesfield Road, Wolverhampton (Wolverhampton 24771).

Buell Ltd., 8-10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761).
Imperial Steel Works, Sheffield, 9 (Sheffield 49054).

Collectron Ltd., 32 Aylmer Road, Leytonstone, London, E.11 (LEYtonstone 3085/4709).
3 Brook Square, Rugeley, Staffordshire (Rugeley 659).

Drummond Dust & Fume Extractors Ltd., Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (LARkswood 4441).

Musgrave & Co. Ltd., St. Ann's Works, Belfast, 5 (Belfast 59411) (8 lines).
46-50 Coombe Road, New Malden, Surrey (MALden 9241).

Rodway & Taylor (Birmingham) Ltd., 85-90 Buckingham Street, Birmingham, 19 (Central 4027/8). (*Dust, fume, ventilating and heating engineers.*)

Spencer & Halstead Ltd., Bridge Works, Ossett, Yorkshire (Ossett 821). ("*Spenstead.*")

WIRE MESH (Welded)

B.R.C. Engineering Co. Ltd., Stafford (Stafford 4441; Telex 36158); Cables: Brenforce, Stafford, Telex).

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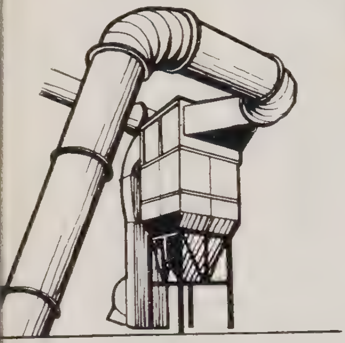

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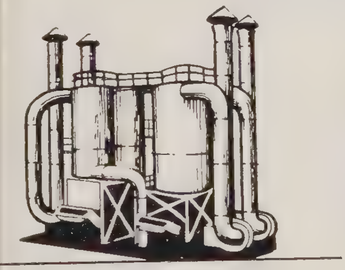

VET ARRESTORS

Vhen the collection of dust
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cceptable, or indeed
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ffers many advantages
ncluding high efficiency. An
fficiency of 99% for all
articles above 3 to 4 microns
an be guaranteed.

HOLMES

DUST COLLECTION AND CONTROL PLANT

a wider range - a wider experience

Detailed technical brochures
are available and
can be had on request.

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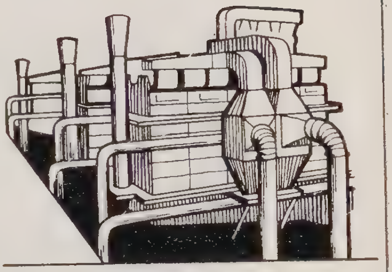


BAG FILTERS

Holmes Bag Filters incorporate design features which make them particularly suitable for applications where high dust burdens are encountered or where dust of an adhesive nature has to be collected. Efficiencies in excess of 99% for all particles, including those of sub-micron size can be guaranteed.

ELECTRICAL PRECIPITATORS

Holmes-Elex Electrical Precipitators have been specifically designed for the removal of extremely small particles, (in the sub-micron range) from all types of carrier gas. Efficiencies in excess of 99% for all particles, including those of sub-micron size can be guaranteed.

G624-1

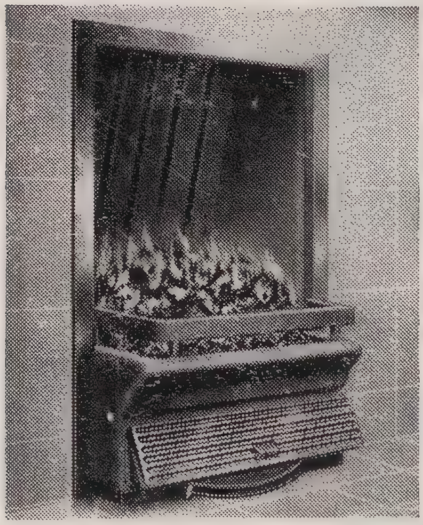
Cut installation costs in smokeless zones

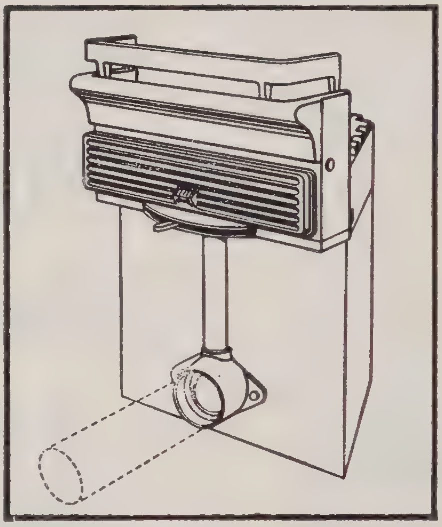
with the latest

LOFIRE

continuous burning fires with

underdraught attachment





The Lofire Model AB continuous burning fire is now available with an underdraught attachment giving the following outstanding advantages:

- Can be installed without cutting existing hearth or lowering existing back boiler
- Burns all kinds of smokeless fuels, especially hard cokes such as Sunbrite
- Retails at only £9 5s.

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The correct type of Dust Collector, as recommended and installed by Green's, will safeguard you legally, will maintain its efficiency without constant and costly maintenance, and moreover give the comfortable assurance that you are fulfilling your obligations to the public weal.

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the new economic Catalytic AFTER-BURNING PLANT

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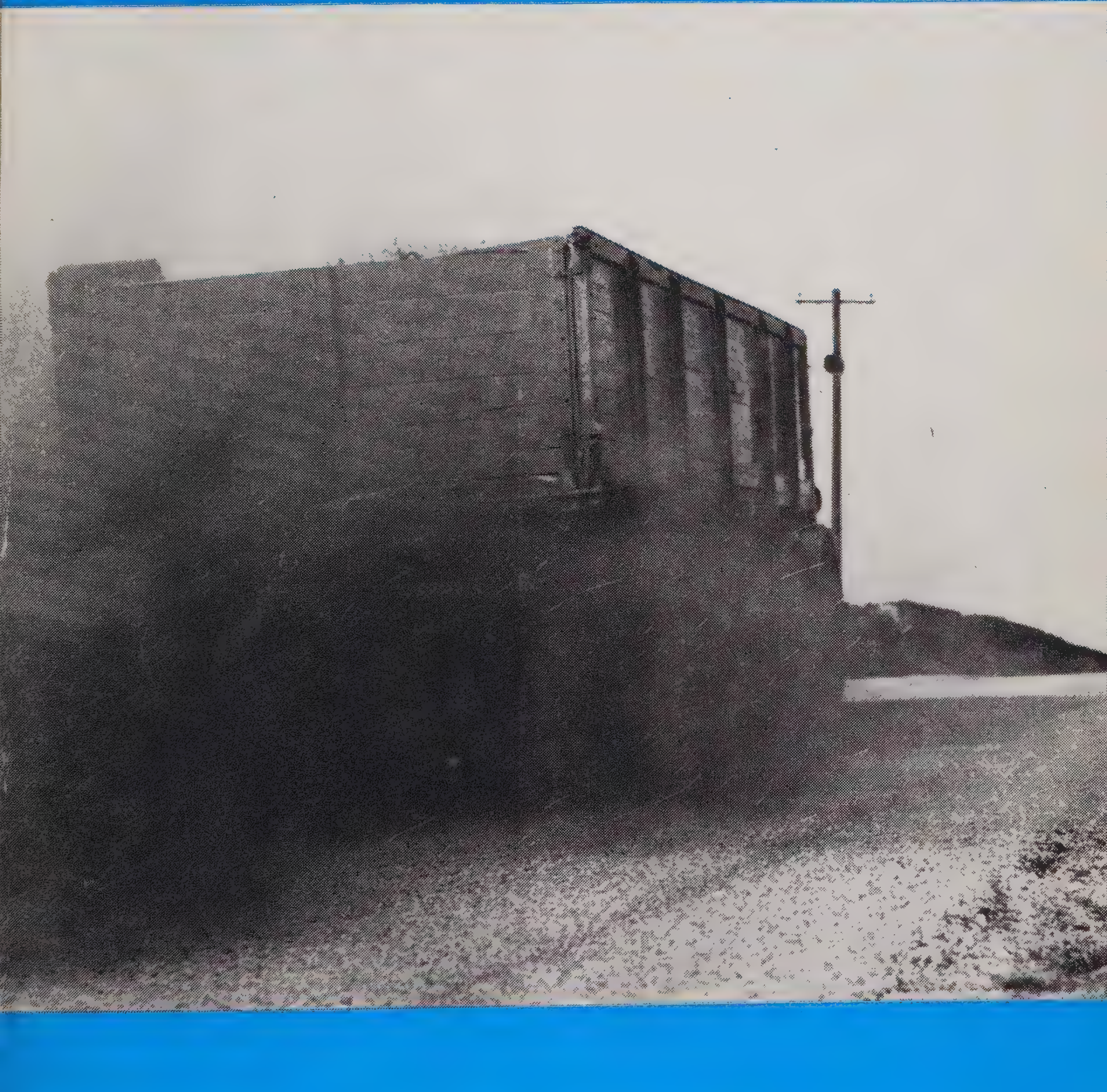

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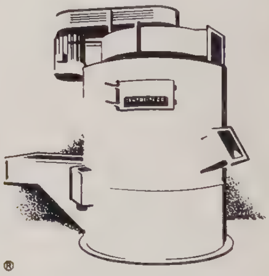

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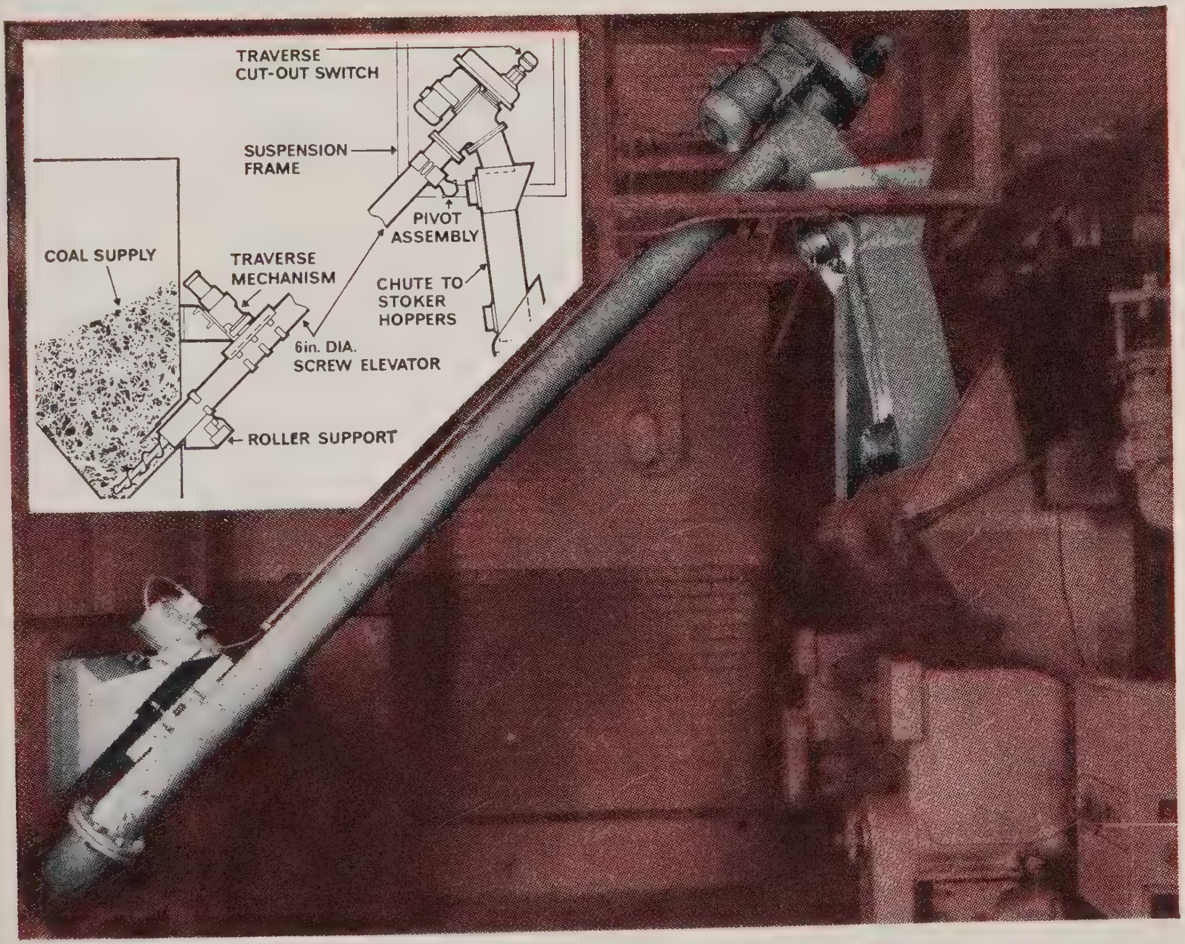

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Coalite is the perfect answer to smokeless zone problems

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THE MODERN SMOKELESS COAL

Gas heat for clean air zones

Domestic heating is the most important consideration when a district becomes a Smoke Control Area. Consider the advantages of gas.

Most homes use gas for cooking. A clean, smokeless fuel is on tap. The installation of radiant-convector gas fires providing automatic, efficient, labour-free heating is a simple matter. They are as cheap to run as traditional fires and because tariffs improve as more gas is used, the householder gains additional economies.

Gas appliance sales are booming, particularly for those heating the home. The public wants this clean, convenient, economical fuel. It is the ideal answer to smoke control problems.

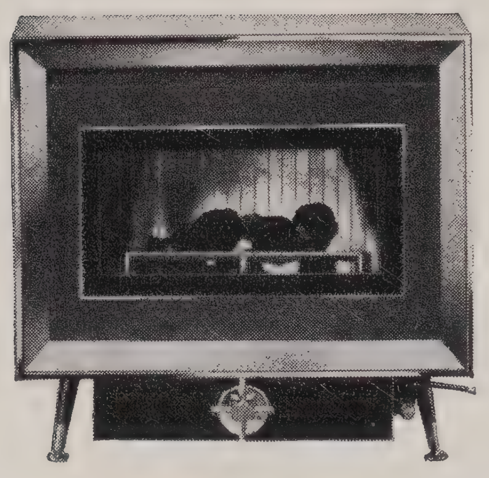
Gas Boards offer a comprehensive service and have helped many local authorities with advice on clean air conversions. The Commercial Manager of your Gas Board would be pleased to help you.

HIGH SPEED GAS

Gas is used extensively in these houses at Dulwich Wood Park, London, built by Wates Built Homes Limited.

ELEGANCE + ECONOMY + HIGH OUTPUT

= The CHATELAINE Room Heater



Chatelaine have combined good looks and efficiency in the Chatelaine Room Heater. Approved by the Domestic Solid Fuel Appliances Approval Council and the Council of Industrial Design, the Room Heater is the ultimate in solid fuel heaters. And so simple to install too!

AVAILABLE IN 4 VERSIONS

Freestanding Model. Room heating capacity 3,000 cu. ft. (21,000 B.Th.U./hour)

Freestanding Model with Domestic Boiler. Room heating capacity 2,000 cu. ft. (12,500 B.Th.U./hour) Boiler output (10,500 B.Th.U./hour).

Inset Model. Room heating capacity 3,000 cu. ft.

Inset Model with High Output Boiler. Room heating capacity 1,850 cu. ft. Boiler—Cast Iron for use with indirect cylinders only. Boiler output–18,000 B.Th.U./hour. Boiler will supply domestic hot water through a lagged 25/30 gallon cylinder and heat 70 sq. ft. of radiating surface including pipes or heat 100 sq. ft. of radiating surface including pipes. NOTE: Water Pipes for the boiler are 1″ B.S.P. and the inlet and outlet may be fitted R or L hand.

Recommended Fuels: Both models will burn overnight without attention, and the following fuels are recommended: Gas coke 1″–2″ (No. 2); Welsh dry steam coal 1″–2″; Anthracite 1″–2″; Sunbrite hard coke 1″–1½″; Coalite; Phimax; Cleanglow; Phurnacite; and other manufactured coals.

Air Control: The supply of air to the room heater is controlled by a spinwheel on the air control door and also by regulating the door.

Tool: A tool is supplied for opening doors, shaking mechanism and removing ashpan.

Colour Range: Copper lustre, grey lustre, black lustre, blue lustre, mahogany, walnut.

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CHATELAINE LIMITED
(a member of the Carron Group)

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Telephone: Falkirk 21331

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IMPORTANT. *When purchasing any incinerator, never rely upon advertised claims of smokelessness. Always insist upon a written guarantee that it will be completely smokeless with any type of refuse.*

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POWER GENERATION AND
INDUSTRIAL BOILER DIVISION

EA A Member of the Elliott-Automation Group

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You get the friendly, cheerful glow that *only* a living fire can give—but no smoke! You also get a lot more. A modern open fire or room heater, burning solid smokeless fuel, will circulate warmth all around the room. Without leaving any chilly corners. This FANTOM open fire has a built in electric fan for forced draught. With high output back boiler it provides domestic hot water and runs five radiators.

Room heaters have the fire enclosed behind glass, they burn slowly, economically (it's the cheapest form of continuous room heating there is) and efficiently. With a high output back boiler, they heat radiators round the house for room-to-room warmth and provide constant domestic hot water.

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is our

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Flue Division Plates

British Patent No. 993916
Insulated Division Plates

British Patent No. 1001461
The Beauvent Econoflu Chimney

British Patent No. 1011196
The Beauvent Concentriflu Chimney

These Patents or Patent Applications all improve the operational or structural design of chimneys. It is not F. E. Beaumont Limited's wish for these Patents or Patent Applications to be restrictive upon other manufacturers as it is in the best interest of the country to promote healthy competition. Consequently, F. E. Beaumont Limited are prepared to licence selected firms to manufacture chimneys to the design covered by these Patents or Patent Applications.

The attention of prospective customers for chimneys, as well as chimney manufacturers, is drawn to the above Patents and Patent Applications and to the Patent Laws.

F. E. Beaumont Limited are sole U.K. Licencees of the invention of Patent Application Nos. 32805/64 and 42625/64 which relate to the Clements-Beauvent multi-flue chimney.

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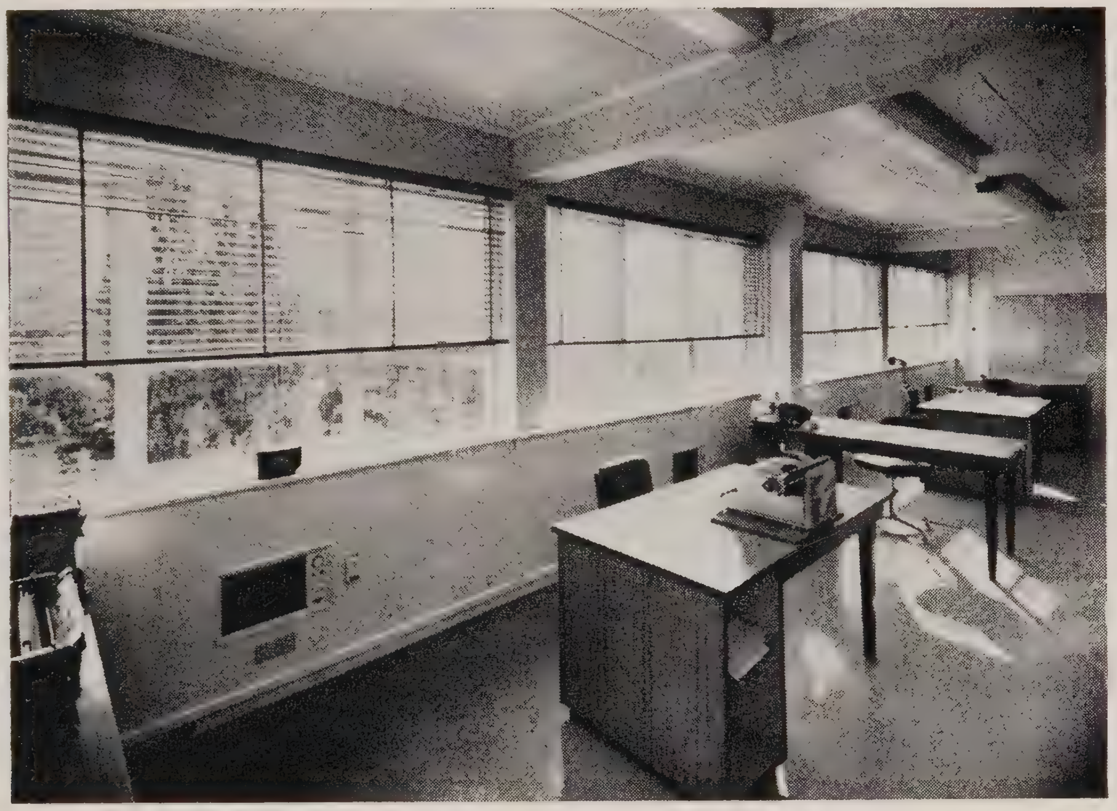
for the MODERN HOME or OFFICE



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Illustrations showing the MH4 in an office and in the home.

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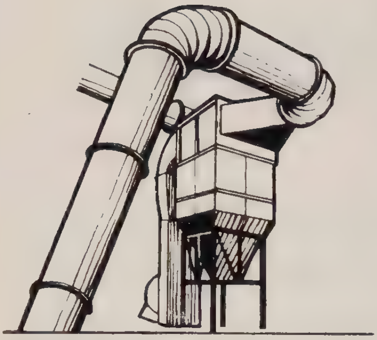
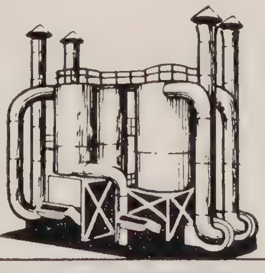


MULTI-CELL CYCLONES

Holmes-Rothemuhle Multi-Cell Cyclones have been designed to reduce stack emissions from stoker and pulverised fuel fired boilers and are an inexpensive and efficient solution to many of the problems involved in the collection of dust and grit particles in the higher size ranges (10 microns and above).



WET ARRESTORS

When the collection of dust or fume in the form of a sludge or liquid effluent is acceptable, or indeed desirable, the Holmes-Schneible Multi-Wash System offers many advantages including high efficiency. An efficiency of 99% for all particles above 3 to 4 microns can be guaranteed.

HOLMES

DUST COLLECTION AND CONTROL PLANT

a wider range - a wider experience

Detailed technical brochures are available and can be had on request.

HOLMES

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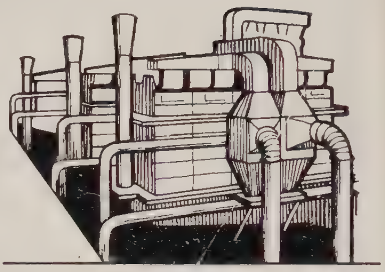

BAG FILTERS

Holmes Bag Filters incorporate design features which make them particularly suitable for applications where high dust burdens are encountered or where dust of an adhesive nature has to be collected. Efficiencies in excess of 99% for all particles, including those of sub-micron size can be guaranteed.

ELECTRICAL PRECIPITATORS

Holmes-Elex Electrical Precipitators have been specifically designed for the removal of extremely small particles, (in the sub-micron range) from all types of carrier gas. Efficiencies in excess of 99% for all particles, including those of sub-micron size can be guaranteed.

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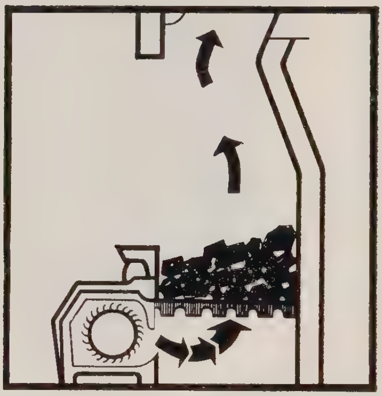
NEW FIRE SAVES COUNCIL £75,000

It's a smokeless Fantom for the coming home!

A new fire is burning to save Councils money—it costs less to buy, less to install, ***and burns ALL smokeless fuels brilliantly... Sunbrite, hard cokes, bituminous fuels etc... all to a fine white ash.***



The saving on a conversion of 5,000 houses in a smokeless zone? £75,000, when compared with any other Approved Appliance guaranteed to burn *all* types of smokeless fuel.

Meets Clean Air Act

The Fantom fire is suitable for installation anywhere, but has been specially designed to conform with the requirements of the Clean Air Act.

Built-in Fan Works Wonders

Secret of the Fantom's success as a forced draught open fire is its built-in centrifugal fan and damper control.
So the Fantom . . .

✻ BLAZES FAST . . . in less than half the normal time.

✻ BANKS OBEDIENTLY . . . for overnight economy and . . .

✻ GETS BACK TO A BLAZE in half the normal time.

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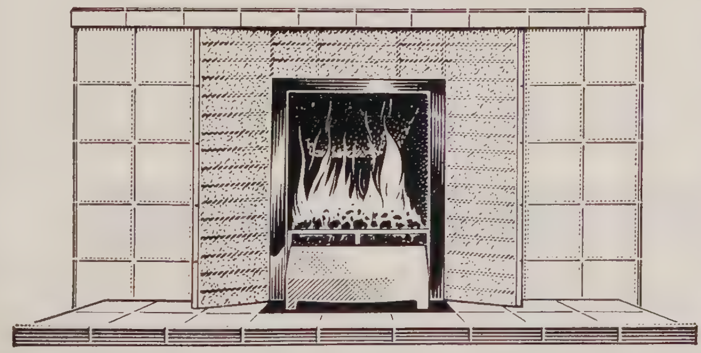
At the incredibly low price of £14.9.8d. for the boiler model and £15.9.8d. for the non-boiler model, the Fantom leaves any other fire standing.
Fixing? All it needs are two screws fixed in *one-eighth* of the time it takes to install any other smokeless fire! No structural alterations needed. Average cost—£1!

Hot Water and Central Heating too

The Fantom can be fitted to any existing back boiler in any standard 16″ fireplace—or installed with a new one to supply all domestic needs.
With a radiator back boiler, the Fantom can supply up to 6 radiators.



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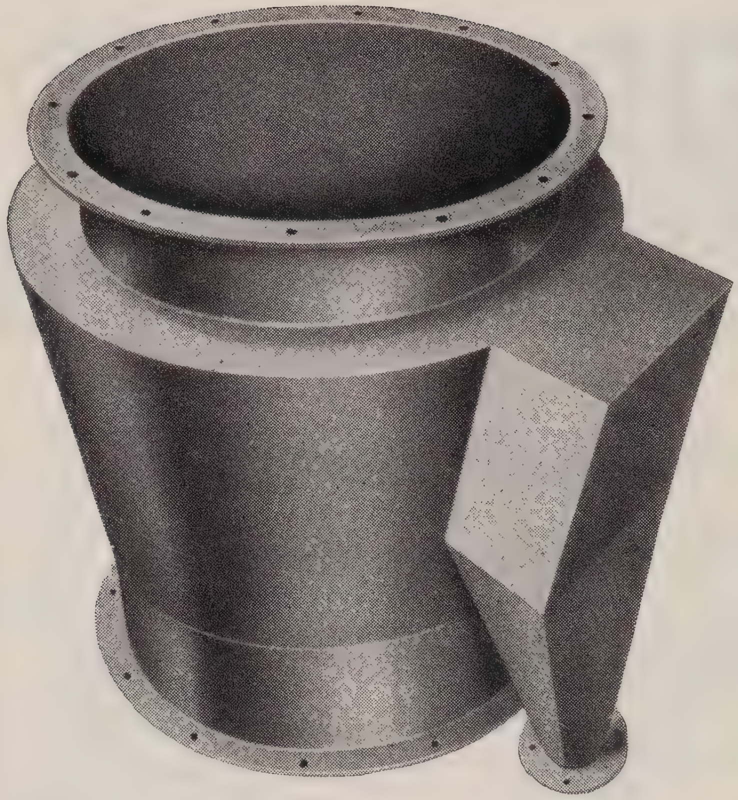

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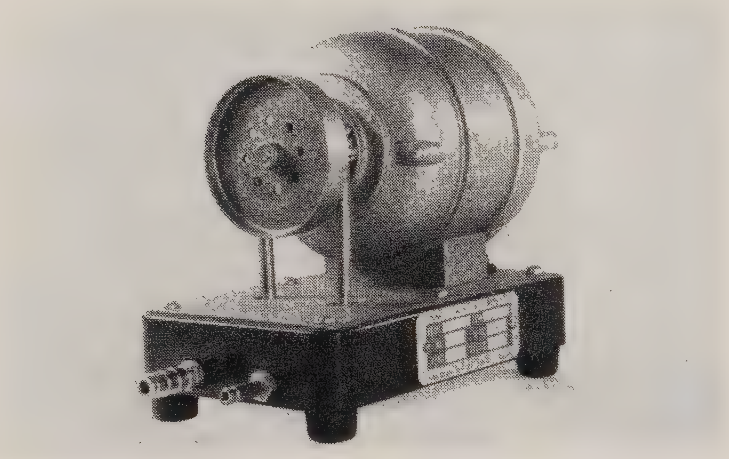

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ISSUED BY THE ELECTRICITY COUNCIL, ENGLAND & WALES

CLEAN AIR YEAR BOOK
1966—1967

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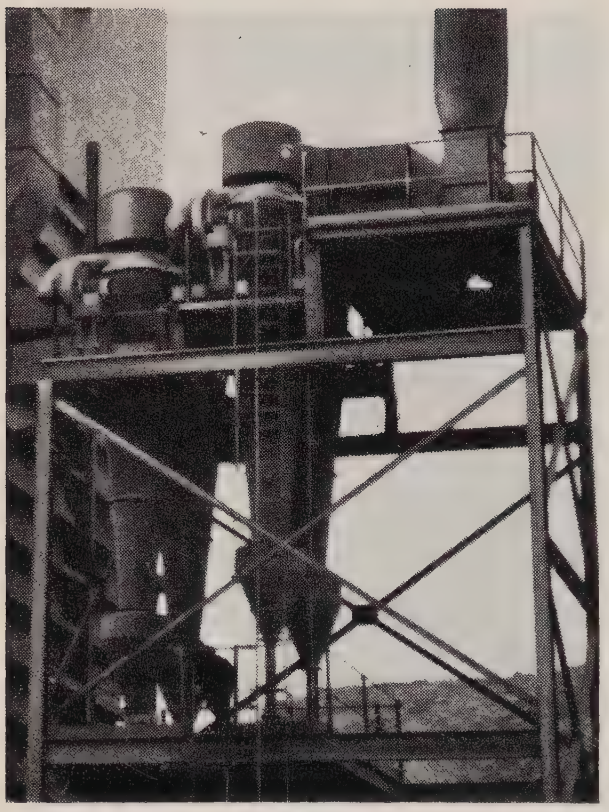

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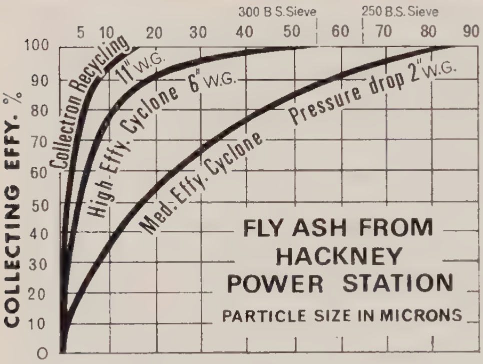

This second vortex can be compared to a moving core with the dust particles travelling on the periphery of the core, its centre being clean. Near the top of the unit there is an annulus through which the dust-laden outer skin of the inner vortex is removed, drawn through a re-cycling fan, which reintroduces the fine dust particles at high speed near the inlet of the Collectron. The constantly entering heavy dust load "blankets" these fine particles pushing them towards the wall of the Collectron where they are collected, and finally discharged at the bottom of the unit by means of a continuous air-seal valve.

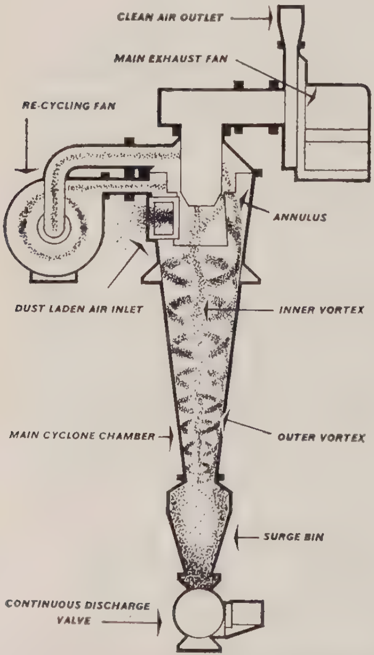

Table showing comparative EFFICIENCY-WEIGHT LOSS and POWER CONSUMPTION figures for inertial collectors handling Fly Ash

Feed in grams	Inertial Collectors	Average Coll. effy. % Materials shown on Graph	Loss in grams	Average Resistance in W.G. at 60° F	Power Consumption H.P. absorbed	Volume Cu.Ft/Min
1,000	Collectron	98	20	11"	3.25	1,000
	H.E. Cyclone	90	100	6"	1.37	
	M.E. Cyclone	75	250	2"	0.98	
5,000	Collectron	98	100	11"	15.7	5,000
	H.E. Cyclone	90	500	6"	6.74	
	M.E. Cyclone	75	1250	2"	4.50	
10,000	Collectron	98	200	11"	32.3	10,000
	H.E. Cyclone	90	1000	6"	13.0	
	M.E. Cyclone	75	2500	2"	10.7	

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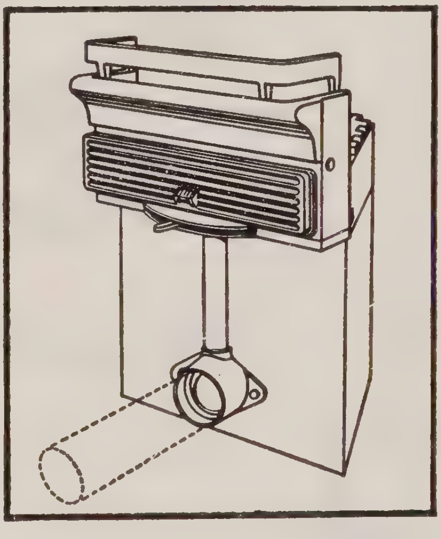

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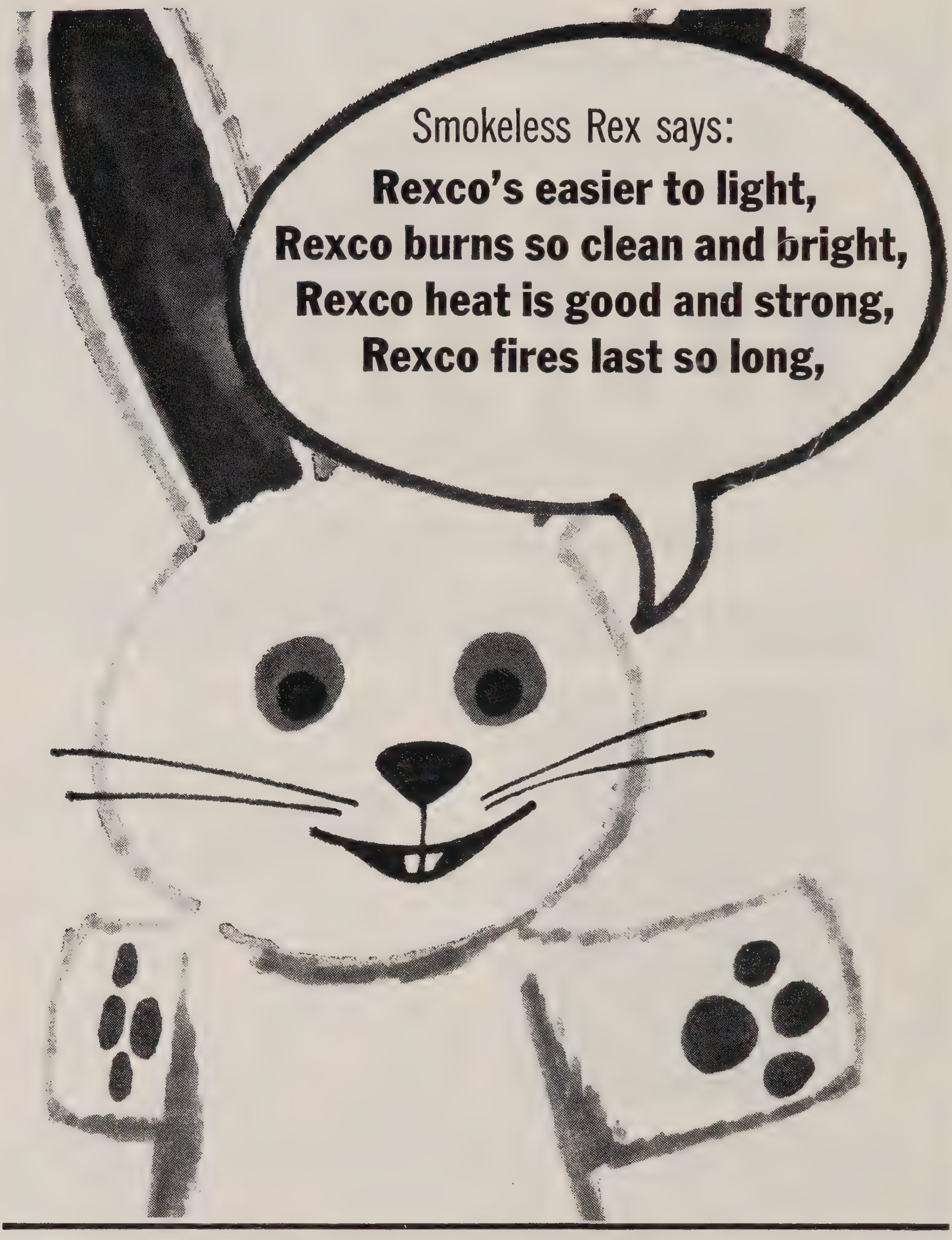

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CLEAN AIR PROGRESS

Review for 1965–6

Smoke Control

SEVERAL developments of importance in relation to the smoke control area programme have occurred during the period under review. First, a circular to local authorities from the Ministry of Housing and Local Government (No. 13/65) pointed out that the solid smokeless fuel supply had improved since the publication of the White Paper of December 1963 on *Domestic Fuel Supplies and the Clean Air Policy*. It was stressed that the increased production referred to specially reactive fuels and not to open grate coke. This was followed by a circular (51/65) which simplified and clarified grant arrangements in smoke control areas. Costs limits for various appliances were given for the guidance of local authorities.

A third, and most important, action was the sending of a letter (dated 14 January 1966) from the Minister of Housing and Local Government to those "black area" local authorities in England which had either made no progress in smoke control or had made only an insignificant amount. The firm tone of this letter created considerable interest and was widely welcomed, except perhaps among the authorities to which it was directed. A similar letter from the Secretary of State was addressed to reluctant authorities in Scotland.

A circular on the supply of open grate fuels was sent to local authorities concerned by the Government of Northern Ireland. The first smoke control order made under the N.I. Clean Air Act has been confirmed for the Dundonald district of Castlereagh R.D.C.

During the year ended 31 March, 1966 the number of premises included in smoke control areas in the black areas (confirmed or waiting decision) rose from 2,277,940 to 2,613,255, and the percentage of the total black areas covered rose from 27·8 to 31·8. The rate of progress is thus seen to be continuing to be very slow, taking the country as a whole, and unless it is improved it will take the best part of the next two decades to complete the programme. The Greater London area maintains its long lead over the other regions, and has now passed the halfway mark.

The First Ten Years of the Clean Air Act

1966 marks the end of the first decade of the Act and discussions have been initiated by the Society on what revisions, if any, are desirable. A full report of a meeting held on 9 May, 1966, at which this question was discussed (with addresses, among others by Sir Hugh Beaver and Sir Gerald Nabarro, M.P.) was published in *Smokeless Air*, Summer 1966. A widespread view is that although the Act could be modified with advantage in a number of points, it is more important that it should first be fully implemented by all authorities throughout the country.

Pollution and Health

Evidence on air pollution as a factor contributing to bronchitis and other respiratory disorders continues to accumulate. The most important report during the period was that on *An Inquiry into the Incidence of Incapacity for Work in different Areas and Occupations*. (Ministry of Pensions and National Insurance, H.M.S.O., London). Sickness benefit costs £220 millions a year, and the total number of weekdays of incapacity is in the order of 280-290 millions a year. The three main groups of disease causing incapacity are bronchitis (35-40 million days), arthritis and rheumatism (20 million) and psychoneuroses (27 million). The only environmental factor considered in detail was air pollution. It was found that there was a significant correlation between bronchitis incapacity and the average levels of smoke and sulphur dioxide in high-density residential districts. There was also more incapacity from arthritis and rheumatism in heavily smoke-polluted areas. The report was revised, and diagrams reproduced in *Smokeless Air*, Spring, 1966.

International Progress

Air pollution prevention activities have been reported from many parts of the world. On legislation mention may be made to the conprehensive South African Clean Air Act and the amendments to the U.S.A. Clean Air Act. Measures for limiting the hydrocarbons and carbon monoxide from petrol driven vehicles in the United States have created considerable interest. Conferences of importance were held in Sydney, New South Wales, Buenos Aires, and (on sulphur dioxide and fly ash) in Czechoslovakia. The 1966 Convention of the Air Pollution Control Association of America was held in San Francisco.

Clean Air Societies have been established in Malta and, more recently, in Australasia. The Committee of the new International Union of Air Pollution Associations met during the Argentine Conference on Buenos Aires, when it confirmed proposals that its first congress should be held in London during October, 1966.

Among many other matters of interest during the period mention may be made of a symposium of the Royal Society of Health on vehicle exhausts and health (reported in *Smokeless Air*, Spring, 1966) and the recent publication by the Society of Chemical Industry of a monograph on *Air Pollution*, by A. R. Smith. This most useful review of the problem was based on a two-year extensive survey carried out by Mr. Smith for the S.C.I.

THE LAW RELATING TO AIR POLLUTION

The principal legislation in Great Britain (excluding Northern Ireland) is the Clean Air Act, 1956. This supersedes the Public Health (Smoke Abatement) Act, 1926, which in its turn amended the smoke abatement section of the Public Health Act, 1875. References to earlier legislation are given in the chronological history of air pollution on another page.

Several amendments to the domestic (smoke control area) provisions of the Clean Air Act were included in the Housing Act, 1964. A note on these changes is given below.

A Clean Air (Northern Ireland) Act received the Royal Assent in 1964. Its provisions are largely identical with the 1956 Act.

Fumes and gases from industrial processes are controlled through the Alkali &c., Works Act, 1906, administered by the Alkali Inspectorate. Under the Clean Air Act smoke, dust and grit emission from certain scheduled processes are also the responsibility of the Inspectorate. (See the section, following, on the Alkali Act.)

Apart from the Clean Air Act it should be noted that action may be taken with regard to smoke or other nuisance from air pollution under common law procedure, and this can be used to secure both damages and an injunction.

In addition to a number of older Local Acts containing smoke abatement provisions, over 50 local authorities obtained powers, between 1946 and 1956, for the establishment of smokeless zones and/or the optional prior approval of new industrial fuel-burning installations. Local authorities may continue to use these provisions unless the relevant sections of their Acts should be repealed, as may be done under section 35 of the Clean Air Act. A number of local authorities have also established smokeless housing estates, where smokelessness is ensured not by legislation but by conditions of tenancy.

Pollution from road vehicles is not controlled under any of the clean air legislation, but through the Road Traffic Act and Regulations, a description of which is given on a following page.

The Clean Air Act in Outline

For a fuller digest of the contents of the Act reference may be made to the *Summary of the Clean Air Act*, published by the Society. The following outline necessarily omits much detail of importance.

SS.1 and 2 deal with **Dark Smoke,** defined as shade No. 2 of the Ringelmann scale. Regulations have been issued on the extent to which dark smoke is permitted. It is an offence to emit dark smoke beyond these limits, and the only defences that may be used are specified: lighting up from a cold furnace; unavoidable failure of plant; unavoidable use of unsuitable fuel; and a combination of any of these. For seven years (from 5th July, 1956) there was a further defence that it was not possible to complete necessary alterations to plant.

(Stat. Inst. 1958. No. 498). (Scotland: Stat. Inst. 1958. No. 1933 (S.106)).

S.3 requires all **New Furnaces,** other than domestic (i.e. less than 55,000 B.Th.U. per hour) to be as smokeless as practicable. Local authorities *must* be notified of new installations and *may* be asked to give prior approval.

S.4 relates to regulations for the installation of **Smoke Density Recorders,** etc.

SS.5 to 9 require all furnaces to use means to minimize **Grit and Dust from Furnaces:** large *new* furnaces (burning more than 1 ton per hour) and all new pulverized fuel furnaces of any size to secure prior approval of grit arresting equipment to be installed; regulations for measuring and recording grit and dust; supplying local authorities with information about such records; and putting outdoor furnaces on the same footing as those in buildings.

S.10, **Height of Chimneys,** gives powers to local authorities to reject plans for new buildings if chimneys are not sufficiently high.

SS.11 to 15 concern **Smoke Control Areas,** which may be established by local authorities under an Order requiring Ministerial approval. Smoke control areas may be entirely smokeless (as with smokeless zones) or may make certain exemptions or impose special conditions. For domestic (and charitable, etc.) premises local authorities may make a grant towards the cost of converting grates, etc., to appliances suitable for smokeless use. The authority may recover part of the grant from the central Exchequer, and normally the cost of conversion will be owner or occupier and local authority 30 per cent each, Exchequer, 40 per cent.

In a case of smoke emission in a control area it is a defence if an authorized fuel only was being burned. Regulations defining authorized fuels have been issued.

(Stat. Inst. 1956, No. 2023).

(The Housing Act, 1964, S.95, amends certain provisions of the above sections).

S.16 deals with **Smoke Nuisances** from smoke other than dark smoke. In this case it is an offence only when a nuisance to inhabitants of the neighbourhood has been proved.

S.17 concerns *processes* that are scheduled as **Special Cases** by Ministerial regulation, and in which the control of pollution will be by the Alkali Inspectorate and not the local authorities. The processes include those that are or will be registered under the Alkali Act. With respect to smoke, grit and dust the Minister may transfer control of particular *premises*, or part of them, to a local authority.

(Stat. Inst. 1958, No. 497). (Scotland: Stat. Inst. 1958, No. 1932 (S.105).)

S.18 on **Colliery Spoilbanks,** requires the owner of a coal or shale mine or quarry to use all practicable means to prevent the combustion of deposited refuse, and to minimize any smoke or fumes that may occur.

S.19 is to the effect that **Railway Engines** are subject to dark smoke emission control as if they were buildings. The owner of the engine must also use any practicable means there may be to minimize smoke emission.

S.20 is to the effect that dark smoke from **Vessels** in specified waters shall be controlled as such smoke from buildings. This applies to vessels in any water not navigable to a sea-going ship and in other defined waters.

(Stat. Inst. 1958, No. 878). (Scotland: Stat. Inst. 1958, No. 1934 (S.107).)

S.21 gives a local authority power of **Exemption** from action under the Act, for a stated period, for research or investigations relevant to the problem of air pollution.

S.22 requires a local authority to report smoke emissions from **Crown Premises** to the Minister responsible for the premises. He must then inquire into the case and if there is cause for complaint must use all practicable means to prevent or minimize the emission or abate the nuisance.

S.23 provides for the setting up of a **Clear Air Council,** with the Minister of Housing, Local Government and Welsh Affairs as its Chairman, to review progress and obtain advice on air pollution matters. There is also a similar Clean Air Council for Scotland.

(Stat. Inst. 1957, No. 766).

S.24 states that **Building Byelaws** "may require the provision in new buildings of such arrangements for heating or cooking as are calculated to prevent as far as practicable the emission of smoke." (A model byelaw for this purpose has now been issued but is being revised to meet the provisions of the Housing Act, 1964).

S.25 gives local authorities power to undertake or contribute towards the cost of **Research and Publicity,** etc.

S.26 relates to the improper **Disclosure of Information** obtained as a result of administering the Act.

S.27. **Penalties.** In summary, and in each case quoting the maximum penalty: *Dark Smoke*, private dwellings, £10; other cases, £100 for each offence (e.g. each day). *New furnaces not smokeless:* £10. *Smoke emission in control areas:* £10 for each offence. *Disclosure of Information:* £100 or 3 months imprisonment, or both. *Other offences:* £100.

S.28 relates to **Authorization of Works.**

S.29 on **Enforcement,** refers to the powers of local authorities.

S.30 on **Notification of Offences** is procedural.

SS.31, 32 and 33 deal with administrative and legal matters.

S.34 on **Interpretation,** gives the meaning to be applied to a number of words and phrases used in the Act.

S.35 deals with **Repeals and Transitions.**

S.36 excludes **Northern Ireland** from the provisions of the Act.

S.37 gives the **Short Title** and commencement of the Act.

The First Schedule relates to the confirmation and coming into operation of orders of local authorities under section 11.

The Second Schedule consists of amendments to the Alkali &c., Works Regulation Act, 1906.

The Third Schedule gives modifications of, and provisions supplementary to, Public Health Acts, etc.

The Fourth Schedule lists the enactments repealed by the new Act.

The Housing Act, 1964

The Clean Air Act, 1956, was amended in respect to dwellings (sections 11 to 15) by section 95 of the Housing Act, 1964. This section is divided into nine subsections, which may be summarized as follows:

(1) A new dwelling is defined as one begun on or after 16 August, 1964. (2) and (3) Local authorities may designate as unsuitable, appliances for which suitable fuels are not fully available in the area. (4) and (5) give local authorities discretionary powers in relation to payment of grants in certain special cases. (6) (7) and (8) provide for the extra cost of discretionary in case of hardship, etc., to be shared between the local authority and the Exchequer. (9) provides for grant to be paid for means for the ignition of solid fuels even if "works" are not involved, which was not previously the case.

For a full description and commentary on these amendments reference should be made to the Ministry of Housing circular No. 46/64.

Clean Air Act Regulations

Authorized Fuels

The Smoke Control Areas (Authorized Fuels) Regulations came into force on 31st December, 1956. These relate to section II of the Clean Air Act, which provides for a defence in the case of smoke emission from a building in a smoke control area if it is proved that the smoke " was not caused by the use of any fuel other than an authorized fuel." The fuels authorized in the regulations are: anthracite, briquetted fuels carbonized in the process of manufacture, coke, electricity, gas, low temperature carbonization fuels and low volatile steam coals.

Liquid Fuels

The Model Building Byelaw described above does not include appliances for the use of liquid fuels, nor do the Authorized Fuel Regulations include liquid fuel as an authorized fuel. The Smoke Control Areas (Exempted Fireplaces) Order, 1957, exempts from control under section 11 of the Clean Air Act fireplaces designed or adapted for the combustion of liquid fuel, " provided they are so installed, maintained and operated as to minimize the emission of smoke." Under section II the Minister may make Orders exempting from control in smoke control areas any fireplace that he is satisfied can be used without producing any substantial quantity of smoke when burning other than an authorized fuel. The Order therefore allows for the use of oil-burning appliances in smoke control areas, and also has the effect of allowing such appliances to be included among those permitted under the Model Building Byelaws.

It should be noted that although the use of oil is thus permitted in smoke control areas and under the Building Byelaw, oil remains a non-authorized fuel, so that in case of smoke emission from an oil-burning installation in a smoke control area the authorized fuel defence could not be used.

Mechanical Stokers

The Smoke Control Areas (Exempted Fireplaces) Order, 1959, exempts mechanical stokers from smoke control area orders in the following terms: "Fireplaces, other than fireplaces fired by pulverized fuel, constructed on or after the 31st day of December, 1956, and equipped with mechanical stokers, or adapted on or after that date for use with such stokers," on condition that "the fireplace shall be so installed, maintained and operated as to minimize the emission of smoke. No fuel shall be used other than that for which the mechanical stoker was designed."

Appliances

The Exempted Fireplaces Order,

1959, also exempts two specified appliances: the Solid Fuel Ductair Unit, manufactured by Radiation Ltd., and the Fulgora Slow Combustion Stove, manufactured by Fulgora Stoves, Ltd., on condition that they "shall be so installed, maintained and operated as to minimize the emission of smoke, and in any case in accordance with the manufacturers' instructions." In the case of the Fulgora Stove it is also a condition that "no fuel shall be used other than wood waste in clean condition." A new, 1966, Order exempts the Hounsell Sawdust Burning Stove with similar conditions.

Building Byelaw

Equipment of New Buildings

A Model Byelaw, to meet the provisions of section 24 of the Clean Air Act has been issued by the Ministry of Housing and Local Government. This provides for new buildings to be equipped with such appliances only as are suitably designed to burn gas, electricity, gas coke or anthracite. It does not apply to larger appliances, of a capacity of 55,000B.Th.U. or more per hour, which are controlled by section 3 of the Act. The byelaw does not require smokeless fuels to be used, but ensures that suitable appliances are installed in new buildings which later may be included in a smoke control area. An appliance suitable for gas coke or anthracite will also be suitable for the more reactive cokes and semi-cokes.

The Byelaw is at present being revised to meet the requirements of S.95 of the Housing Act, 1964.

Firelighting by Sticks and Paper

Circular 28/60 of the Ministry of Housing and Local Government states that while gas remains the best and most convenient means of lighting solid smokeless fuels in smoke control areas, there will be houses which cannot be supplied with gas at a reasonable cost and also some people may object to having gas at all. For the present, therefore, the Minister accepts that the small amount of smoke caused in this way must be accepted in the general interest of making progress with the creation of smoke control areas.

" The Minister thinks that legal cover for the use of sticks and paper for lighting fires can best be given by the use in smoke control orders of the power of exemption in section 11(3) of the Clean Air Act, 1956. Local authorities could give an exemption in general terms extending to fireplaces in any building or separately occupied parts of a building which is not supplied with town gas; or alternatively, they could give a specific exemption to named individual premises. Either type of exemption should be subject to a condition to secure that it would have effect only where authorized fuels or kindling sticks and paper were being used ".

The Minister asks that such exemption should be included where it is apparent that some buildings or parts of buildings will remain without a gas supply. He also asks that if a local authority should decide not to include an exemption along these lines in such a case, then they should give an explanation when submitting the order for confirmation.

Dark Smoke Regulations

In Statutory Instrument 1958, No. 498, " The Dark Smoke (Permitted Periods) Regulations, 1958," the Minister of Housing and Local Government has made the regulations required for the operation of Section 1 (2) of the Clean Air Act. The Regulations permit the following:

(i) Not more than 10 minutes dark smoke emission in the aggregate from any chimney in any period of 8 hours.

(ii) This permitted time extended to 14 minutes if soot blowing is carried out within the 8 hour period.

(iii) The 10 and 14 minutes to be

extended for chimneys serving more than one furnace as follows:
A chimney serving 2 furnaces, 18 and 25 minutes respectively; a chimney serving 3 furnaces, 24 and 34 minutes respectively; a chimney serving 4 or more furnaces, 29 and 41 minutes respectively.

(iv) A continuous emission of dark smoke from the chimneys of factories (other than that caused by sootblowing) for a period not exceeding 4 minutes.

(v) The emission of black smoke up to 2 minutes in the aggregate in any period of 30 minutes.

The regulations apply to dark smoke from the chimneys of factories, shops, offices and railway engines, but not to dark smoke from the funnels of ships, for which separate regulations have been made, as set out below.

Dark Smoke (Permitted Periods) (Vessels) Regulations

These regulations, under s.1(2) of the Clean Air Act, are contained in Statutory Instrument 1958, No. 878. They specify the periods within which dark smoke is permitted from vessels in various classes of case, as detailed in the schedule below. The phrases in italics, "10 minutes in 2 hours", etc., mean that 10 minutes emission of dark smoke *in the aggregate* is permitted in any period of 2 hours.

Schedule—Classes of Case

1. Emissions from a forced draught oil-fired boiler furnace, or an oil engine. 10 *minutes in* 2 *hours.*
2. Emissions from a natural draught oil-fired boiler furnace (except in the cases falling within class 4 below). 10 *minutes in* 1 *hour.*
3. Emissions from a coal-fired boiler furnace:
   (*a*) when the vessel is not under way (except in the cases falling within class 4 below). 10 *minutes in* 1 *hour.*
   (*b*) when the vessel is under way. 20 *minutes in* 1 *hour.*
4. Emissions from a natural draught oil-fired boiler furnace or a coal-fired boiler furnace in the following cases:
   (*a*) a vessel with funnels shortened for the purpose of navigating the Manchester Ship Canal;
   (*b*) a tug not under way, but preparing to get under way or supplying power to other vessels or to shore installations;
   (*c*) a vessel not under way but using main power for the purpose of dredging, lifting, pumping or performing some other special operation for which the vessel is designed. 20 *minutes in* 1 *hour.*
5. Emissions from any other source. 5 *minutes in* 1 *hour.*

In addition, *continuous* dark smoke caused otherwise than by the soot-blowing of a water-tube boiler, shall not exceed:

(1) in the case of classes 1 and 2 above, 4 *minutes.*

(2) in the case of natural draught oil-fired boiler furnaces in class 4, 10 *minutes.*

Further, in *no case* shall black smoke (Ringelmann 4) be emitted for more than 3 *minutes* in the aggregate in any period of 30 *minutes.*

The Alkali, etc., Works Regulation Act

The Alkali, etc., Works Regulation Act, 1906, consolidates and extends previous similar Acts, the first of which was passed in 1863.

The Act includes a schedule of chemical processes and a list of noxious or offensive gases. Since 1906, this schedule and list have been extended by Statutory Orders made under the Public Health (Smoke Abatement) Act, 1926 and the Alkali, etc., Works Regulation (Scotland) Act, 1951. Such orders were made in 1928, 1935, 1939 and 1950. The essence of the Act lies in the requirements that (1) scheduled processes must be registered annually, (2) as a prior condition in the case of a first registration the scheduled process must be provided to the satisfaction of the Chief Inspector with the " best practicable means " for preventing the escape of noxious or offensive gases to the atmosphere and for rendering such gases harmless and inoffensive, (3) the " best practicable means " must thereafter be maintained in good and efficient working order and must be operated continuously, (4) in the case of certain processes, upper limits are specified for the concentration of total acidity in effluent gases which may be discharged to the atmosphere.

Provision is made for the setting up and maintenance of an inspectorate to administer the Act, and regulations are included relating to the registration and inspection of works, general procedure, penalties, etc. The Chief Inspectors are required to make an Annual Report to be laid before Parliament, relating to the work of the inspectorate.

Under the Clean Air Act, 1956, the provisions of the Alkali Act are extended to apply to smoke, dust and grit from premises controlled under the Act as they already do to noxious or offensive gases. Thus from 31st December, 1956 virtually all forms of air pollution from processes registered under the Alkali Act will be subject to control under that Act by the Alkali Inspectorate. Any other parts of a work are the responsibility of the local authority.

The Alkali, etc., Works Orders, 1958, 1961, *and* 1963

The Minister of Housing and Local Government extended the Alkali Act by an Order which came into operation on 1st June, 1958. This Order added to the list of processes scheduled under the Act a number which are responsible principally for smoke, grit and dust. Among these processes are a number for the production of iron and steel, iron or steel melting processes, and some copper and aluminium processes. Gas and coke works, electricity works, coal fired producer gas plant and lime kilns and certain ceramic kilns fired by coal or oil were also added to the list together with sulphate reduction and caustic soda plant and certain types of chemical incinerators. The Order also made the appropriate additions to the list of noxious or offensive gases.

The 1961 Order deals with emissions from the processing of uranium, beryllium, selenium and their compounds. The 1963 Order is much more comprehensive and was prepared largely to take into account the major changes which have taken place in recent years in the heavy chemical and allied industries. It also covers the burning of scrap cable to remove the insulation. This is necessary because of the increasing amount of cable covered with polyvinyl-chloride, which, on burning, gives rise to hydrochloric acid, chlorides and possibly phosgene. The Order begins the policy of descheduling certain of the 1958 Order Smoke process.

Road Traffic Pollution Law

The Statutory Regulations governing the emission of smoke or other forms of pollution from road vehicles are made by the Minister of Transport and Civil Aviation in exercise of the powers conferred on him by sections 3, 17, 30, and 111 of the Road Traffic Act, 1930 (20 & 21 Geo.5.c.43.).

The Regulations at present operative came into force on 1 November, 1963 and are known as "The Motor Vehicles (Construction and Use) Regulations 1963. (Statutory Instruments 1963, No. 1646)." Under Part IIA. of the Regulations, governing the construction, weight and equipment of vehicles, Regulation 22 (Emission of smoke or vapour), states: "Every motor vehicle shall be so constructed that no avoidable smoke or visible vapour is emitted therefrom."

Regulation 23(1) includes compression ignition (i.e., diesel) engines in the words "motor vehicles", and (2) requires excess fuel devices to be so fitted that they cannot be operated by a person while he is being carried by the vehicle, unless (a) such a device cannot be used after the engine has been started, or (b) does not cause any increase in smoke or visible vapour.

Part III of the Regulations governs the Use of Vehicles. Regulation 80 states:

"No person shall use or cause or permit to be used on a road any motor vehicle from which any smoke, visible vapour, grit, sparks, ashes, cinders, or oily substance is emitted if the emission thereof causes or is likely to cause damage to any property of injury to any person who is actually at the time or who reasonably may be expected on the road, or is likely to cause danger to any such person as aforesaid".

Regulation 81 relates to the use of the excess fuel device, and requires such a device to be so maintained that it does not cause the engine to be supplied with excess fuel while the vehicle is in motion on a road; nor allows any person so to use it.

(*The operation of the regulations, by Ministry of Transport officers, and by the Police, is discussed, together with the technical factors involved, in a paper by H. D. Fawell, Ministry of Transport, published in the NSCA Harrogate Conference*, 1964, *Proceedings.*)

Chimney Height

The effects of air pollution are proportionate to the concentration of the pollutants, and where pollution is unavoidable (which includes the products of combustion from any fuel, and in particular the gases from sulphur-bearing fuels) it is desirable to secure the greatest dispersion possible. Apart from the Alkali Act, which requires that emitted noxious and offensive gases shall be rendered harmless and offensive, the only legislation to promote the dispersion of chimney gases is Section 10 of the Clean Air Act, 1956. This controls the height of chimneys, other than those of residences, shops and offices. Plans submitted in accordance with building byelaws which show that it is proposed to erect a chimney, may be rejected unless the local authority is satisfied that the chimney will be of a height "sufficient to prevent so far as practicable the smoke grit dust and gases from becoming prejudicial to health or a nuisance".

The Act gives no definition of sufficient height, which depends on the circumstances of each case. Use has been made of various formulae for determining the required height. These formulae are of some complexity and more recently a simpler form of guide has been issued by the Ministry of Housing and Local Government. (Memorandum on Chimney Heights, H.M.S.O., 1963, 1s. 3d. net. Reprints of the nomograms on Permatrace are available from H.M.S.O. at a cost of 10s.)

The calculations required first take account of the amount of sulphur dioxide emitted per hour, and assume that the efflux velocity of the flue gases will not be less than that indicated for different types of installation. The guide then shows how the "uncorrected chimney height" may be calculated. This is the height appropriate for the relevant maximum rate of SO_2 emission when account has been taken of the neighbouring sources of pollution, the local background level of pollution, and the general character of the district. The uncorrected height is never less than 40 feet.

A key of five different types of district is given and by the use of nomograms the uncorrected chimney height for very small, small, medium and large installations is read off. If the uncorrected chimney height thus determined is not less than 2½ times the height of the building to which the chimney is attached, or any other building in the immediate vicinity, no further correction need be made. If however the uncorrected height is less than 2½ times the height of such buildings, a further correction has to be made. This correction is partly based on the ratio between the greatest length and height of the building (to the ridge), since this influences the effect of down-draughts.

On a further nomogram a line is taken from the uncorrected chimney height through a point representing the building height to a reference line. From here another line is drawn through a point representing the height of the building or its greatest length, whichever is lower, to a point indicating the final height. This is subject to any adjustment that may be necessary to ensure that the chimney top is never less than 10 feet above the ridge of the building, nor less than the uncorrected height.

The Working Party on Chimney Heights has been reconvened primarily to have another look at its advice to the Minister so far as it relates to very small installations, with a view to modifying the Memorandum. Difficulty has been experienced in its application to this class of furnaces. At the same time the opportunity is being taken to review the remainder of the Memorandum.

Smoke Control Areas

Summary of Progress as at 30th June 1966

(1) *Region*	(2) *No. of acres covered by smoke control orders confirmed or awaiting decision*	(3) *Percentage* of total black area acreage in the region so covered*	(4) *No. of premises covered by smoke control orders confirmed or awaiting decision*	(5) *Percentage of total black area premises in the region so covered*
Northern	20,075	16.0	88,150	15·9
East and West Ridings ..	99,520	26·4	348,840	29·9
North Midlands ..	24,520	9·1	90,080	17·6
Greater London ..	162,055	49·6	1,433,925	54·3
North Western ..	107,410	26·8	490,805	28·8
Midlands ..	50,350	20·2	222,045	21·1
South Western ..	5,050	19·2	18,105	12·2
Wales and Monmouthshire	45	0.01	650	0·2
Totals	469,025	22.3	2,692,600	32.8

*The percentage shown in columns (3) and (5) above are percentages of the *total* acreage and of the *total* number of premises in the black areas concerned. In practice it may not always be necessary for the whole of a black area authority's district to be covered by smoke control orders (e.g. there may be some areas of open country).

Grant Arrangements

A circular of the Ministry of Housing and Local Government (51/65) of June 1965 introduced important modifications to the grant arrangements in smoke control areas following the changes made in Circular 69/63. This followed the report on domestic fuel supplies and permitted grants to be made on openable stoves or room-heaters, and equivalent appliances using other fuels. Difficulties arise in the interpretation of what is "reasonably necessary" and are said to have involved both the local authorities and the department in a great deal of correspondence.

This circular has now been amended by Circular No. 25/66 to take account of new appliances, increases in costs and developments in the testing of electric storage heaters.

The circular lists the cost limits for various types of appliances. 19 items are listed as an appendix, and as they are of especial general interest the list is quoted in full below.

It is for the local authority to decide, within the appropriate cost level, what costs are reasonable in each case. The Minister will accept as qualifying for Exchequer contribution expenditure which is acceptable to the local authority and which falls within the limits shown in this list, but he will not normally accept any portion of the cost (excluding installation cost) which exceeds the stated limit.

It is pointed out that it remains a principle that facilities of a standard approximately equal to that of existing facilities should be provided, but that extra costs should not be incurred solely to provide higher standards. It is pointed out that the installation of a modern smokeless appliance in place of a coal-burning fireplace may incidentally provide a higher standard of heating, but that this will not preclude grant on the full payment.

A number of other matters are referred to, and a further appendix revises paragraph 26 of the Ministry's Memorandum on Smoke Control Areas, in which reference is made to the changes arising from S.95 of the Housing Act, 1965.

Smoke Control Area Grants; Cost Limits for Various Appliances (Circular 25/66)

	£
Improved open fire (including integral gas ignition and, where necessary, deepening plate and bar)	6
Improved open fire (including integral gas ignition and, where necessary, deepening plate and bar) with boiler	17*
Underfloor draught fire and fan-assisted open fire	17
Underfloor draught fire and fan-assisted open fire with boiler	23*
Solid fuel room heater	26
Solid fuel room heater with boiler	36*
Gas room heater	24
Electric thermal storage heater	29
Oil room heater	16
Solid fuel cooker with boiler	60
Gas or electric cooker	35
Independent solid fuel boiler, **including installation**	25
Gas water heater (e.g. gas circulator and back boiler unit), **including installation**	25
Electric immersion water heater, **including installation**	15
Wash boiler, gas and electric	13
Gas poker, including flex and tap	2
Bottled gas igniter, if gas container is hired	3
Bottled gas igniter, including purchase of gas container	6
Electric kindler	8

* £2 may be added where

(i) it would be impossible or inadvisable to connect the existing boiler to the new space-heating appliance,

and

(ii) either

(*a*) the existing boiler is itself bower-barffed or made of stainless steel, copper, aluminium, bronze or other superior material,

or

(*b*) one of the above types is necessary to comply with local water bye-laws.

SMOKE CONTROL AREAS

Programmes and Progress

The following lists contain the names of Local Authorities in the "Black Areas" with (1) the target date for completion of their Smoke Control Programme, (2) the final acreage, (3) acreage in operation on June 1, 1966, (4) total number of premises in operation on June 1, 1966.

The figures have been compiled as accurately as possible from the records of the Ministry of Housing and Local Government, from "Smoke Control 1962-1966' and from information received by the Society directly from the new 32 Greater London Boroughs. Where no figures are given in columns 1 and 2, this means that the Authority in question has not submitted a programme to the Minister of Housing and Local Government.

The figures in italics refer to acres and premises in smokeless zones established by some Local Authorities before the Clean Air Act and in areas where smoke control operates through tenancy agreements.

NORTHERN

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.6.66	4 *Premises (In Oper.)* 1.6.66
Tyneside and Wearside				
Gateshead C.B.	1980	4,677	337	2,106
Newcastle C.B.	1980	11,401	3,388	11,235
South Shields C.B.	—	—	—	—
Sunderland C.B.	1980	9,013	1,440	20,313
Tynemouth C.B.	1987	5,000	—	—
Jarrow B.	1970	1,500	155	1,154
Wallsend B.	1975	3,544	466	3,680
Blaydon U.D.	—	—	291	735
Boldon U.D.	—	—	—	—
Felling U.D.	—	—	366	2,800
Gosforth U.D.	1970	—	—	—
Hebburn U.D.	1974	1,563	556	1,136
Longbenton U.D.	—	—	—	—
Newburn U.D.	1975	4,648	345	2,380
Ryton U.D.	—	—	—	—
Whickham U.D.	1972	6,213	13	217
Teeside				
Darlington C.B.	—	—	—	—
Middlesbrough C.B.	1974	7,131	2,520	12,637
West Hartlepool C.B.	1973	4,976	760	1,036
Hartlepool B.	1970	1,608	42	734
Stockton-on-Tees B.	1982	6,084	—	—
Thornaby-on-Tees B.	1971	1,993	982	532
Billingham U.D.	1966	2,092	1,042	3,830
Eston U.D.	1972	3,000	38	494

YORKSHIRE

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.6.66	4 *Premises (In Oper.)* 1.6.66
West Riding (North)				
Bradford C.B.	1975	25,503	6,251 *1,481*	26,540 *14,284*
Dewsbury C.B.	1975	6,720	567	3,842
Halifax C.B.	1977	14,081	2,180	11,415

	Target Date 1	*Final Acreage* 2	*Acreage (In Oper.)* 1.6.66 3	*Premises (In Oper.)* 1.6.66 4
Huddersfield C.B.	1980	14,147	12,816	8,677
Leeds C.B.	1975	40,613	6,229	38,020
Wakefield C.B.	1977	5,800	1,230	2,950
Batley B.	1977	4,461	803	1,589
Brighouse B.	1975	7,875	2,205	4,126
Castleford B.	—	—	34	507
Keighley B.	1970	3,238	2,700	10,352
Morley B.	1977	9,994	3,459	3,827
Ossett B.	1969	3,332	808	3,335
Pontefract B.	1979	4,865	611	802
Pudsey B.	1980	5,205	208	552
Spenborough B.	1972	8,600	2,019	4,974
Aireborough U.D.	1970	6,856	2,809	4,567
Baildon U.D.	1970	2,830	1,378	1,980
Bingley U.D.	1970	11,018	2,329	6,343
Denholme U.D.	—	—	—	—
Elland U.D.	1978	5,951	30	423
Featherstone U.D.	—	—	—	—
Heckmondwike U.D.	1970	697	273	963
Horbury U.D.	1969	1,280	208	847
Horsforth U.D.	1968/70	2,706	872	3,161
Knottingley U.D.	1969	2,837	710	2,481
Mirfield U.D.	1979	—	475	1,223
Normanton U.D.	1979	3,061	—	—
Queensbury and Shelf U.D.	1975	2,795	455	898
Rothwell U.D.	1971	10,695	927	1,504
Shipley U.D.	1974	2,184	1,506	6,225
Sowerby Bridge U.D.	1973	4,000	380	618
Stanley U.D.	—	5,169	370	310
West Riding (South)				
Barnsley C.B.	1981	7,811	414	954
Doncaster C.B.	1970	8,371	1,396	5,795
Rotherham C.B.	1973	8,000	1,068	5,234
Sheffield C.B.	1972	39,598	16,059	53,811
Connisborough U.D.	—	—	—	—
Cudworth U.D.	1975	1,746	—	—
Darfield U.D.	—	—	—	—
Darton U.D.	1972	4,718	—	—
Dearne U.D.	—	—	—	—
Dodworth U.D.	—	—	—	—
Hoyland Nether U.D.	—	—	—	—
Mexborough U.D.	—	—	—	—
Rawmarsh U.D.	—	—	—	—
Royston U.D.	—	—	—	—
Swinton U.D.	—	—	89	851
Wath-upon-Dearne U.D.	1972	2,665	455	639
Wombwell U.D.	—	—	—	—
Worsborough U.D.	1976	1,660	—	—
Rotherham R.D.	—	—	—	—
East Riding				
Kingston-upon-Hull C.B.	1971	12,000	4,848	27,682

NORTH WESTERN

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.6.66	4 *Premises (In Oper.)* 1.6.66
South Lancashire and North-East Cheshire				
Bolton C.B.	1970	5,401	1,451 *86*	11,451 *1,050*
Bury C.B.	1971	2,168	1,038	3,900
Manchester C.B.	1969	27,255	10,199 *523*	54,502 *4,764*
Oldham C.B.	—	6,392	1,543	4,483
Rochdale C.B.	1971	9,556	4,030 *67*	11,488 *337*
Salford C.B.	1967	5,202	2,200 *57*	18,759 *1,859*
Stockport C.B.	1975	8,439	1,007	7,192
Wigan C.B.	1973	5,083	1,256	3,074
Altrincham B.	1973	3,519	45	547
Ashton-under-Lyne B.	1973	4,146	567	3,432
Dukinfield B.	—	1,725	698	670
Eccles B.	1970	3,417	2,045	3,004
Farnworth B.	1974	1,504	—	—
Heywood B.	1970	8,342	1,429	4,662
Hyde B.	1975	4,170	850	6,143
Leigh B.	1971	6,359	475	3,302
Middleton B.	1981	5,170	1,213	7,445
Mossley B.	1970	1,200	54	541
Prestwich B.	1975	2,420	2,279	3,150
Radcliffe B.	—	4,915	477	843
Sale B.	1970	3,628	1,710	8,282
Stalybridge B.	1975	3,030	587	2,741
Stretford B.	1969	3,530	1,014	5,323
Swinton and Pendlebury B.	1975	3,363	599	2,626
Abram U.D.	—	—	—	—
Aspull U.D.	—	—	—	—
Atherton U.D.	1970	2,289	966	1,050
Audenshaw U.D.	1973	1,241	541	557
Blackrod U.D.	—	—	—	—
Bredbury and Romily U.D.	1973	688	442	1,409
Chadderton U.D.	1969	3,013	1,865	4,917
Cheadle and Gatley U.D.	1966	5,285	2,993	9,657
Crompton U.D.	—	2,865	419	1,316
Denton U.D.	1970	2,592	1,700	9,837
Droylesden U.D.	1973	1,245	432	2,608
Failsworth U.D.	1970	1,663	236	2,205
Golborne U.D.	1975	5,765	—	—
Hindley U.D.	1979	2,612	225	999
Horwich U.D.	—	—	—	—
Ince in Makerfield U.D.	—	—	—	—
Irlam U.D.	—	4,717	748	2,541
Kearsley U.D.	1975	1,720	11	84
Lees U.D.	—	—	—	—
Little Lever U.D.	—	808	—	—
Royton U.D.	1973	2,149	202	312
Tottington U.D.	—	2,544	—	—
Tyldesley U.D.	1975	5,174	—	—
Urmston U.D.	1972	3,944	404	2,595
Westhoughton U.D.	1979	5,834	120	607

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.6.66	4 *Premises (In Oper.)* 1.6.66
South Lancashire and North-East Cheshire (continued)				
Whitefield U.D.	1967	3,386	3,049	3,527
Worsley U.D.	1973	7,240	262	2,131
Central Lancashire				
Blackburn C.B.	1985	8,088	712	5,963
Burnley C.B.	1971	4,695	761	6,298
Preston C.B.	1975	6,357	1,636	8,798
			176	*1,918*
Accrington B.	1975	4,418	—	—
Colne B.	1976	817	117	1,039
Darwen B.	1975	—	279	572
Nelson B.	—	—	—	—
Barrowford U.D.	—	—	—	—
Brierfield U.D.	—	—	—	—
Church U.D.	1980	528	226	997
Clayton-le-Moors U.D.	1975	1,060	—	—
Fulwood U.D.	1975	3,164	—	—
Great Harwood U.D.	—	—	—	—
Oswaldtwistle U.D.	—	—	—	—
Padiham U.D.	—	976	493	1,350
Rishton U.D.	1979	1,087	—	—
Merseyside				
Birkenhead C.B.	1979	8,043	2,176	5,628
Bootle C.B.	1975	3,054	774	4,453
Liverpool C.B.	1972	27,818	11,453	54,003
St. Helens C.B.	1970	8,865	8	227
Wallasey C.B.	—	5,961	4,436	19,408
Warrington C.B.	1980	4,639	616	6,031
Bebington B.	1980	2,220	707	4,803
Ellesmere Port B.	1977	3,724	866	4,707
Widnes B.	1970	4,500	1,819	4,407
Ashton-in-Makerfield U.D.	—	—	—	—
Haydock U.D.	—	—	—	—
Huyton-with-Roby U.D.	1970	3,054	683	2,701
Kirby U.D.	1965	2,072	502	3,346
Litherland U.D.	—	1,180	—	—
Newton-le-Willows U.D.	1978	2,800	152	1,068
Prescot U.D.	1976	748	124	1,152
Runcorn U.D.	1970	3,116	845	2,628
MIDLANDS				
Derby, Nottingham and Chesterfield				
Derby C.B.	1986	8,000	870	6,443
Nottingham C.B.	1975	18,364	2,444	10,039
			125	*2,000*
Chesterfield B.	1975	8,472	1,202	4,943
Ilkeston B.	1983	3,017	—	—
Mansfield B.	1980	7,009	955	2,229
Alfreton U.D.	—	5,023	—	—
Arnold U.D.	—	—	—	—
Beeston and Stapleford U.D.	1975	6,468	3,532	7,090

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.6.66	4 *Premises (In Oper.)* 1.6.66
Derby, Nottingham and Chesterfield (continued)				
Bolsover U.D.	1974	4,326	86	167
Carlton U.D.	1970	4,018	46	332
Dronfield U.D.	1970	4,567	390	3,200
Eastwood U.D.	—	—	—	—
Hucknall U.D.	—	4,029	—	—
Kirkby-in-Ashfield U.D.	—	—	—	—
Long Eaton U.D.	1975	3,559	13	112
			57	*750*
Mansfield Woodhouse U.D. . .	—	—	—	—
Stavely U.D.	1976	6,504	—	—
Sutton-in-Ashfield U.D.	1982	165	42	312
West Bridgford U.D.	—	3,045	—	—
Basford R.D.	—	—	—	—
Chesterfield R.D.	1972	29,000	846	4,107
North Midlands				
Leicester C.B.	1975	16,990	3,484	21,601
West Midlands				
Birmingham C.B.	1974	51,147	7,213	53,537
			203	*1,387*
Coventry C.B.	1978	19,171	3,607	15,576
			30	*232*
Dudley C.B.	1975	4,328	1,294	7,395
Smethwick C.B.	1979	2,500	457	4,273
Walsall C.B.	1980	8,777	1,203	2,829
West Bromwich C.B.	1980	7,172	314	8,570
Wolverhampton C.B.	1979	—	1,641	5,321
Bilston B.	—	—	—	—
Halesowen B.	1970	5,247	981	4,037
Nuneaton B.	1978	11,767	2,896	4,037
Oldbury B.	1984	3,304	306	1,770
Rowley Regis B.	—	—	—	—
Solihull B.	1989	13,645	1,908	2,738
Stourbridge B.	1975	4,000	758	2,108
Sutton Coldfield B.	1979	13,978	386	1,934
Tipton B.	1971	2,167	178	899
Wednesbury B.	1970	959	120	1,286
Aldridge U.D.	—	9,284	753	6,995
Amblecote U.D.	1974	665	—	—
Bedworth U.D.	—	—	—	—
Brierly Hill U.D.	1974	5,000	1,793	10,293
Brownhills U.D.	—	—	70	657
Coseley U.D.	1966	—	—	—
Darlaston U.D.	—	—	52	512
Sedgley U.D.	1973	3,823	1,399	2,425
Wednesfield U.D.	1970/72	2,515	940	4,818
Willenhall U.D.	1972	2,834	417	3,049
Potteries				
Stoke-on-Trent C.B.	1980	21,209	2,071	3,902
Newcastle-under-Lyme B. . .	1980	8,882	2,320	4,938
Kidsgrove U.D.	1979/80	4,095	61	596

SOUTH WEST

Bristol				
Bristol C.B.	1975	26,345	5,051	18,105

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.)* 1.6.66	4 *Premises (In Oper.)* 1.6.66
South Wales and Monmouthshire				
Newport C.B.	—	—	43	651
Pontypridd			*8,141*	*12,717*

(By arrangement, only low volatile coal to be sold in the area).

LONDON

Greater London Boroughs				
City of London (completed)	1955	677	677	21,700
Barking	1970	10,788	4,707	37,564
Barnet	1976	22,123	7,328	39,615
Bexley	1975	15,183	1,818	9,254
Brent	1971	10,924	4,868	32,624
Bromley	1976	39,266	4,073	18,451
Camden	1968	5,364	3,544	68,397
Croydon	1975	23,814	2,967	25,165
Ealing	1971	13,708	5,676	45,404
Enfield	1970	20,061	12,495	41,043
Greenwich	1970	11,298	6,044	40,036
Hackney	1967	5,018	4,314	53,300
Hammersmith	1967	3,988	2,817	62,742
Haringey	1968/69	7,491	5,378	70,030
Harrow	1975	12,555	1,618	14,015
Havering	1972/73	29,550	5,506	24,723
Hillingdon	1975	27,258	9,051	22,298
Hounslow	1970	14,635	5,925	26,128
Islington	1970	3,679	1,578	40,111
Kensington and Chelsea (Royal)	1971	2,951	1,613	40,358
Kingston-upon-Thames (Royal)	1978	9,281	1,880	10,004
Lambeth	1976	6,727	1,421	27,558
Lewisham	1968	8,579	7,224	76,180
Merton	1975	9,379	3,797	17,948
Newham	1977	8,960	566	2,053
Redbridge	1970	13,983	3,551	23,699
Richmond-upon-Thames	1970	13,962	6,047	32,568
Southwark	1975	6,981	2,713	31,981
Sutton	1975	10,372	2,851	17,683
Tower Hamlets	1967	4,798	3,627	48,964
Waltham Forest	1976	9,805	3,490	31,334
Wandsworth	1970	8,868	3,871	32,500
Westminster (City)	1968	5,333	4,569	105,472
Outer London				
Dartford	—	—	—	—
Epsom and Ewell	—	—	—	—

Scotland

Total Acreage and Premises in Operation at 1.6.66

	Acreage	*Premises*		*Acreage*	*Premises*
Barrhead	150	738	Kilmarnock	77	281
Clydebank	1,076	4,760	Lanark County	683	2,222
Coatbridge	343	2,191	Midlothian County	1,070	5
Dumbarton	1,089	3,997	Milngavie	281	4
Dundee	4,064	14,126	Motherwell	759	4,353
East Kilbride	1,702	5,679	Paisley	3,054	11,423
Edinburgh	4,914	18,542	Renfrew Burgh	400	821
Falkirk	1,485	3,085	Rutherglen	376	2,170
Glasgow	13,516	70,446	Stirling County	1,103	4,693
Grangemouth	351	1,720	West Lothian	2,384	24

Local Authorities outside the Black Areas

Local Authorities outside the Black Areas who have Smoke Control Areas in operation, with total acreages and premises to 1.6.66

	Acreage	Premises
Aylesbury B.	275	535
Basildon U.D.	1,921	13,423
Bedford B.	1,358	5,510
Blaby R.D.	267	1,850
Blackburn R.D.	260	413
Brentwood U.D.	188	2,327
Burton-on-Trent C.B.	180	1,548
Cambridge B.	23	279
Chatham B.	792	4,181
Cheltenham B.	840	1,493
Cheshunt U.D.	794	4,115
Connah's Quay (Flintshire) U.D.	53	—
Corby U.D.	441	3,566
Crawley U.D.	3,115	8,786
Crewe B.	270	1,087
Elstree R.D.	500	2,877
Exeter C.B.	429	3,899
Gillingham B.	3,760	7,641
Glanford Brigg R.D.	744	1,808
Gloucester C.B.	85	672
Grantham B.	1,000	3,022
Gravesend B.	686	1,381
Harlow U.D.	5,889	17,291
Hazel Grove and Bramhall U.D.	272	1,156
Hemel Hempstead B.	2,057	4,064
High Wycombe B.	1,972	5,170
Hornchurch U.D.	4,620	22,698
Kingswood U.D.	12	130
Lancaster B.	32	746
Leamington Spa B.	841	2,414
Leek U.D.	96	18
Letchworth U.D.	198	1,666
Lincoln C.B.	1,389	408
Luton C.B.	959	5,289
Marple U.D.	69	405
Northfleet U.D.	393	1,317
Old Fletton U.D.	123	962
Oxford C.B.	998	2,764
Peterborough B.	354	1,924
Potters Bar U.D.	35	416
Reading C.B.	1,049	4,713
Rochester B.	1,012	3,122
Saddleworth U.D.	227	413
Scunthorpe B.	2,659	7,232
Seisdon R.D.	57	24
Shrewsbury B.	379	582
Skipton U.D.	69	370
Slough B.	2,022	7,370
Southampton C.B.	184	1,399
South East Derbyshire R.D.	28	288
Southport C.B.	67	250
Staines U.D.	6,207	10,124
Thurrock U.D.	2,691	7,238
Todmorden B.	206	1,656
Warwick B.B.	124	1,011
Watford B.	887	3,612
Wellington U.D.	232	11
Wetherby R.D.	157	670
Whitley Bay B.	110	797
Wilmslow U.D.	257	1,803
Winsford U.D.	433	4,225
Wortley R.D.	460	1,368
Wrexham (Wales) B.	51	437

Warren Spring

The Work of the Warren Spring Laboratory of the Ministry of Technology on the Investigation of Air Pollution and its Abatement

Warren Spring Laboratory carries out research on the nature and extent of air pollution, and on its prevention and abatement, in order to provide technical information necessary for the administration of clean air legislation, for town planning and the location of industry, and for research into the effects of air pollution.

The National Survey of Air Pollution

The National Survey, devised by Warren Spring Laboratory, is planned statistically to enable valid conclusions to be drawn on the incidence of air pollution in urban areas throughout the country, while restricting observations to a reasonably small number of sites. Some 120 towns were chosen for the purpose and each agreed to make daily measurements of smoke and sulphur dioxide in the following five types of district, in so far as examples are to be found in each town:

(*a*) Residential area with a high population density, such as old terrace housing.

(*b*) Residential area with a low population density, such as a housing estate or suburb.

(*c*) Industrial area.

(*d*) Commercial area, with central heating predominating.

(*e*) Smoke control area, which may be any of the above types.

Observations are also being made at a number of sites in the depth of the country to give background information. All sites for the survey were chosen by the local authority in collaboration with Warren Spring Laboratory, and on 1 April, 1966, observations for this statistically-planned part of the Survey were being made by 120 authorities operating 413 instruments and a further 33 authorities in the area administered by the Greater London Council operating 216 instruments.

In addition, a further total of 248 local authorities and others were making daily observations of smoke and sulphur dioxide at 452 sites. These measurements are being made on the initiative of the authorities concerned, and primarily for their own local purposes, but they form a second part of the National Survey and comparison of these results with the national averages established by the first part of the survey will be of great value.

Under part three of the Survey a further 60 sites were operated by 42 authorities in rural areas, to provide data on drift of pollution and background information.

Other Measurements of Air Pollution

In addition to the daily smoke and sulphur dioxide observations, many local authorities and other bodies make monthly measurements of grit-and-dust-fall, using the British Standard Deposit Gauge, and of the rate of reaction of sulphur compounds with lead dioxide. Warren Spring Laboratory continues to give advice and help in connection with such measurements.

Standing Conference of Co-operating Bodies

All local authorities and other organizations who make measurements of air pollution, either as part of the National Survey or purely for their own local purposes, and who submit the data regularly to Warren Spring Laboratory for publication, are entitled to send representatives to the Standing Conference of Co-operating Bodies. This Conference meets twice yearly to discuss matters of interest connected with air pollution. Other bodies may do so on payment of a subscription. At 31 March, 1966, 421 bodies had appointed representatives to the Conference. This number is considerably smaller than for the previous year because of the disappearance of authorities when the Greater London Council was created.

Publication of Results

All data submitted to the Laboratory are collated, and summaries are published in a Monthly Bulletin, one section of which deals with daily measurements of smoke and sulphur dioxide, and another with monthly measurements made with the deposit gauge and the lead dioxide instrument. A third section of the Bulletin contains abstracts of papers and other information on air pollution that have appeared in the period concerned. Annual Summaries of the data are also published.

These Bulletins and Annual Summaries are available on request to all concerned with problems of air pollution.

In addition, a series of Reports on the Investigation of Atmospheric Pollution published by H.M. Stationery Office, gives analyses of these results and an account of research on the measurement and abatement of air pollution.

Instruments

Work by the Laboratory on the calibration of the daily smoke filter and on the accuracy of the daily hydrogen peroxide method for sulphur dioxide has now led to British Standard Specifications on both methods and to their acceptance internationally by the Organization for Economic Co-operation and Development (OECD). Effort is now concentrated on the development of a reasonably cheap automatic SO_2-recorder.

Town Planning Studies

In the past few years it has become increasingly apparent that while it is quite impracticable to control the amounts of sulphur oxides in the air by limiting their emission (as is done for smoke under the Clean Air Act) it is, nevertheless, possible to make great improvements by taking full advantage of natural dispersion processes. This can be done by the proper design of chimneys in relation to buildings and the proper siting of the various types of residential district in relation to each other and to industrial installations. A great deal of effort is being devoted to obtaining sufficient knowledge of the distribution and spread of pollution in urban areas to enable town planners to do their work satisfactorily from an air pollution point of view.

An intensive investigation is in progress on the effect of the turbulence in the wake of tower blocks of offices or flats on the pollution in the neighbourhood. Another concerns the spacing of such blocks from each other and from separate large industrial emitters. A third has to do with the design of the chimney on the tower block itself.

The more general problem of the design of chimneys in relation to buildings, to avoid flue gases being entrained in the turbulent wake, is being studied by means of a furnace and chimney that can be erected at various positions in relation to the large laboratory block at Warren Spring Laboratory. Parallel tests are being carried out by the National Physical Laboratory on corresponding models in a wind tunnel. This investigation has been undertaken at the request of the Federation of British Industries.

The spread of pollution in a town from a single emitter is being investigated at Cambridge using tracers emitted from a low chimney.

While the National Survey provides a great deal of information on the distribution of pollution in urban areas this is being supplemented by special investigations. Thus a survey in Sheffield is being undertaken in co-operation with the Department of Geography of the University to examine the build-up and dispersion of pollution over the city. The effects of topography, weather conditions, and relation of industry to housing are being examined.

Removal of Oxides of Sulphur from Flue gas

While it is recognized that it would be impracticable, economically and technically, to contemplate the universal application of methods of removing oxides of sulphur from flue gas, it is considered that if a suitable process were available it might have limited but important applications. The general problem of desulphurizing flue gas with carbon is therefore being investigated with, at the moment, particular attention to the removal of sulphuric acid mist, as, in one instance, the Laboratory has used the method successfully on a large scale.

British Standards relating to Air Pollution

B.S.

758 Small domestic hot-water supply boilers using solid fuel.
Part 1. Manually-controlled boilers.
Part 2. Thermostat-controlled boilers.

893 Method of testing dust extraction plant and the emission of solids from chimneys of electric power stations.

1251 Open fireplace components.
Part 1. Firebacks for use with inset open fires.
Part 2. Fireplace surrounds and hearths.
Part 3. Adjustable chimney-throat restrictors (insertible).
Part 4. Lintels.

1252 Domestic solid fuel cookers with integral boilers.

1334 Thermal insulating materials.

1747 Methods for the measurements of air pollution.
Part 1. Deposit gauges.
Part 2. Determination of concentration of suspended matter.
Part 3. Determination of sulphur dioxide.
Part 4. The lead dioxide method.

1756 Methods for the sampling and analysis of flue gases.
Part 1. Methods of sampling.
Part 2. Analysis by the Orsat apparatus.
Part 3. Analysis by the Haldane apparatus.
Part 4. Miscellaneous analyses.
Part 5. Semi-routine analyses.

2740 Simple smoke alarms and alarm metering devices.

2741 Recommendations for the construction of simple smoke viewers.

2742 Notes on the use of the Ringlemann Chart.
C: 1957 Ringlemann Chart.
M: 1960 Miniature smoke chart.

2811 Smoke density indicators and recorders.

2845 Coke-burning inset open fires without boiler and without convection.
Part 1. Dimensional and constructional requirements.
Part 2. Performance and constructional requirements.

2978 Measurements of smoke emission from industrial boilers.
Part 1. Medium capacity coal-fired water-tube boilers with travelling grates.
Part 2. Coal-fired shell boilers with various types of mechanical stokers.

3107 Small incinerators for the destruction of hospital dressings.

3128 Constructional and performance requirements for inset open fires with boiler and without convection.

3142 Manufactured solid smokeless fuels for household use.
Part 1. Cokes for domestic open fires.
Part 2. Cokes for domestic closed appliances.

3250 Thermal testing of domestic solid fuel burning appliances with convection.
Part 1. Flue loss method.
Part 2. Hood method.

3316 Large incinerators for the destruction of hospital waste.

3328 Domestic gas pokers and portable underbar ignition burners.

3376 Open fires with convection, with or without boiler.

3377 Back boilers for domestic solid fuel appliances.

3378 Domestic heating stoves using coke and other solid fuels.

3405 Simplified methods of measurement of grit and dust emission from chimneys.

3813 Incinerators for waste from trade and residential premises.
Part 1. 1964 Capacities between 50 lb/h and 1,000 lb/h.

3841 Method for the measurement of smoke from manufactured solid fuels for domestic open fires.

3929 Domestic solid fuel ignition pokers and portable undergrate ignition burners for use with commercial butane.

All the above Standards are obtainable direct from the British Standards Institution at British Standards House, 2 Park Street, London, W.1. British Standards are revised, when necessary, by the issue either of amendment slips or of revised editions. It is important that users of British Standards should ascertain that they are in possession of the latest amendments or editions.

Estimates of Air Pollution in Great Britain in 1964

Tables prepared by Dr. Albert Parker, C.B.E.

(1) From the Main Uses of Fuel

Figures in millions of tons to the nearest 0·1m. tons for quantities of fuel, smoke, and grit and dust, and to the nearest 0·01m. tons for sulphur dioxide)

Fuel and Class of Consumer	*Quantity of Fuel*	*Pollutants Discharged*		
		Smoke	*Grit and Dust*	*Sulphur Dioxide*
Coal				
Domestic (including miners' coal)	27·9	0·9	0·1	0·71
Electricity works	67·4	small	0·3	2·06
Railways	3·8	0·1	0·1	0·11
Industrial and miscellaneous ..	39·9	0·2	0·3(*a*)	1·16
Coke ovens	25·5	small	small	0·09
Gas works	20·2	small	small	0·14
	184·7			
Coke (excluding consumption in gas works and blast furnaces) ..				
Domestic, including other manufactured solid smokeless fuels ..	6·1	nil	small	0·13
Industrial and miscellaneous ..	7·3	nil	small	0·18
	—	1·2	0·8	4·58
Oil				
Domestic				
Kerosene and domestic fuel oils	1·9	very small	nil	0·01
Industrial				
Kerosene, gas/diesel and fuel oils, and creosote-pitch	33·3(*b*)	small	nil	1·60
Road and Rail Transport				
Motor spirit, gas/diesel and fuel oils	14·5	small	nil	0·06
Marine Craft				
Gas/diesel and fuel oils ..	1·1	small	nil	0·04
	50·8(*c*)	small	nil	1·71
Total for coal and oil	—	1·2	0·8	6·29

(*a*) Excluding grit and dust emissions, estimated at about 0·4m. tons from industrial processes other than steam raising.

(*b*) The amount of 33·3m. tons is equivalent in heating value to about 56m. tons of coal, which if used for the same purposes would have produced about 0/3m. tons of smoke, 0/3m. tons of grit and dust, and 1·6m. tons of sulphur dioxide.

(*c*) The amount of 50·8m. tons of oil is equivalent to about 86m. tons of coal, so that the coal equivalent of the coal and oil consumed (excluding air transport) in Great Britain in 1964 was about 271m. tons.

The estimates for road vehicle pollution on the following page, published for the first time, were made by Dr. Parker on the basis of the most recent analyses of the exhaust gases with the engines operating under various conditions.

The estimated quantity of carbon monoxide discharged into the air in 1964 from the other industrial and domestic uses of all fuels is about 12 million tons of which nearly one half was from domestic heating appliances.

(2) From Road Vehicles

Consumption of Motor Spirit	9·755m. tons
Consumption of Derv fuel	3·564m. tons

Pollutant	*Quantity in Million Tons from* *Petrol Engines*	*Diesel Engines*
Carbon monoxide	5·0	0·08
Hydrocarbons	0·25	0·016
Aldehydes	0·01	0·002
Oxides of nitrogren	0·15	0·050
Sulphur dioxide	0·015	0·030

The Cost of Air Pollution

The most recent general inquiry into the cost of air pollution in Britain was made by a sub-committee of the Committee on Air Pollution (the Beaver Committee), the findings of which were included as an appendix in the final report of the Committee in 1954. Members of the Committee have since stated that they consider the estimates to be too conservative.

The main conclusions of the Report were:

(1) The direct costs of pollution to which figures can be put ("however hazardous") are as follows:

	£m. per annum
Laundry	25
Painting and decorating ..	30
Cleaning and depreciation of buildings other than houses ..	20
Corrosion of metals	25
Damage to textiles and other goods	52·5
	152·5

It is considered that these figures are under-estimates, and as certain items have been omitted, it is concluded that the direct costs of air pollution are *of the order of at least £150 million a year.*

(2) The "loss of efficiency". The following figures are given as "a rough guess at possible orders of magnitude": £10m. a year loss to agriculture; £55m. a year loss of working efficiency in manufacturing industry; £60m. a year in other sections, including transport—altogether "the loss of efficiency resulting from pollution might be as great as the direct costs", but to avoid danger of over-estimates a figure of £100m. a year is suggested.

(3) The value of the fuel lost under the conditions which produce smoke is estimated to be £25m. to £50m. a year, but it is considered that this should not be included as one of the costs of pollution.

The total estimated cost is given as £250m. a year, equivalent to £10 per head in the black areas and £5 elsewhere throughout Great Britain, plus the value of the fuel lost.

The National Industrial Fuel Efficiency Service

The National Industrial Fuel Efficiency Service, formed in May, 1954, is a non-profit organization which offers industry, local authorities and commercial property owners practical help in the use of heat and power, whatever type of fuel is used.

N.I.F.E.S. services include Heat and Power Surveys, which show by precise measurement where waste occurs in factory premises and how it can be prevented. This service is also used in plant extension or development projects. Boiler house efficiency tests and methods of increasing the efficiency of steam-raising plant. Advice on improving the efficiency of heat-using process plant, furnaces and power plants. Regular service, designed to bring a factory or premises to a high degree of efficiency in the use of fuel and to maintain it at that level. Checks on space-heating systems and advice on insulation. Advice on the Clean Air Act requirements and the reduction of smoke and grit emission. N.I.F.E.S.

uses equipment specially designed by the British Coal Utilization Research Association as a basis for advice in grit emission cases. It is also used to test the operation and efficiency of grit arrestors which, under the Clean Air Act, are required to be properly maintained and used. A comprehensive series of training and refresher courses for boiler plant operators, works and plant engineers, and all those whose work is connected with fuel and steam-using plant. For the benefit of those who are unable to attend technical colleges, N.I.F.E.S. has a specially designed study course (arranged in conjunction with the College of Fuel Technology) leading to the City and Guilds of London Boiler Operator's Certificate.

All enquiries should be addressed to the appropriate Area Engineer at the address given in the Directory.

The International Union of Air Pollution Prevention Associations

The International Union that has now been established consists of non-governmental organisations only. Its primary functions are to promote collaboration and the exchange of information on air pollution problems, and to organize, through its member associations, international congresses. Particulars of the six founder member associations are given below.

Air Pollution Control Association of America. 4400 Fifth Avenue, Pittsburgh, Pennsylvania 15213.

Established in 1907, with a full-time secretariat since 1950. The Association is a voluntary, co-operative, non-profit organization of 2,7000 members who include engineers, scientists, enforcement officials, industrial organization and manufacturers. The Association serves as a forum for discussion of air pollution problems with technical orientation.

It publishes the monthly *Journal of the Air Pollution Control Association*, as well as its *APCA Abstracts*. The Abstracts contain summaries from 800 technical journals throughout the world of current air pollution literature.

The Association, governed by a body of 17 members of the Board of Directors, has the purposes of fostering the control of air pollution and improving sanitation of the air. The Association's Technical Council, composed of 40 volunteer committees, works towards international adoption of reasonable engineering performance standards. In addition to members from the United States, the Association presently has members from 35 other countries.

President, 1966-67: James H. Huguet.
Executive Secretary: Arnold Arch.

Asociación Argentina Contra la Contaminación del Aire. Sarmiento 680, Buenos Aires, Argentina.

Founded in 1962 as a result of the first Latin American Conference on Air Pollution, and obtained the legal status of a civil association in 1964.

The present membership of 100 includes doctors in medicine, hygiene and chemistry; sanitary engineers, army officers, executives and industrial enterprises. Though non-governmental, many of the members are civil service officers. A grant is made to the association by the municipality of Buenos Aires.

The aims are for the public welfare and to promote the fight against air pollution in the urban and industrial centres of the country, employing scientific, educational and cultural means. An international conference was held at Buenos Aires in November, 1965.

President: Dr. Jose A. Rispoli.
Secretary-General: Dr. Damian D. Torti.

Association pour la Prévention de la Pollution Atmosphérique. 62 rue de Courcelles, Paris, 8, France.

The objects of the Association are to initiate and co-ordinate studies leading to a better understanding of the problems of air pollution; to organize investigations in the large towns with a view to determining the distribution of air pollution (for which regional groups have been set up); to co-operate with the public authorities in pollution control; to inform and instruct the public; to present exhibitions under the patronage of the Ministry of Health in the large towns; and to publish the four-monthly journal *Pollution Atmosphérique*.

President: M. le Professeur Moureu
Secretary-General: M. Y. Queret.

Heat Control Society, Japan. Kanto-Shin-Etsu Heat Control Society, 54 Takata-Oimatsu-cho, Bunkyo, Tokyo, Japan.

The purposes and activities of the Society are to conduct diagnoses of problems, lecture and training courses (including by correspondence) and other publicity activities to promote efficiency of fuels for the following purposes: (i) prevention of loss of fuels; (ii) prevention of heat losses during transmission and transportation; rationalization of combustion, gasification, distillation, heating and heat transmission; and prevention of air pollution from industrial plant.

There are seven other similar societies covering the whole area of Japan. The eight organize central conferences on heat control. Total expenditure is about £63,000 and total membership about 1,900 concerns.

President: Hirotoshi Honda.
Standing Director: Takahide Taga

National Society for Clean Air. Field House, Breams Buildings, London, E.C.4., England.

Full details of the Society will be found in the colour pages of this volume.

VDI-Kommission Reinhaltung der Luft. Düsseldorf, Prinz-Georg-Strasse, 77-79, W. Germany.

The VDI Clean Air Commission, as a specialized section of a technical and scientific association, namely the German Association of Engineers (Verein Deutscher Ingenieure), does not in itself have the character of an association. It comprises collaborators from all the branches of knowledge relating to clean air, including practice, legislation and administration.

Their functions include: determining the causes, nature and extent of air pollution; making emission limits for dust and gases; research on the emission on pollutants and on chimney heights; research on the effects of air pollution; fixing the limit values of imissions (the Maximum Imission Concentrations, or MIK); establishment or development of standard procedures for the measurement of dusts and gases both at the discharge point and at the points of emission.

There are at present in the Commission 310 independent experts and scientists working in honorary capacities on 8 committees and 55 subcommittees. The results of their work are laid down in the VDI Regulations, arranged as follows: (i) General; (ii) MIK values, (iii) dispersion of pollutants, (iv) limiting emissions, (v) analysis and measuring techniques. So far, 60 regulations have been published, 33 others are either in preparation or planning stage. The Commission also initiates research studies, of which over 100 have been started so far. More than 8 million D. Marks have been provided by public funds for this purpose. (More details of the work of the Commission are included in a leaflet "Aufbau, Aufgaben Forschung", which will be supplied on request by the Commission.)

President: Dr. H. Stephany.
Secretary · Ing. H. Krämer.

Major Smog Disasters

The word "smog" was first used by the late Dr. H. A. Des Vœux, founder-president of the N.S.A.S., in 1905, to denote the combination of smoke and natural fog that in urban areas may have disastrous consequences. There are numerous cases of smog conditions resulting in a marked rise in mortality and morbidity from respiratory disorders and consequential cardiac failure. Among these incidents are the following.

London, 1873. Rise in bronchitis deaths, compared with the previous week, of 268.

London, 1880. Rise in bronchitis deaths, compared with the previous week, of 692.

London, 1891. Rise in bronchitis deaths, compared with the previous week, of 572.

Glasgow, 1909. Average number of deaths in the 3 weeks prior to the fog were 57 per week. During 5 weeks of fog or haze the deaths per week were: 138, 233, 171, 198 and 137.

Manchester and Salford, 1930-31. In December, with no fog, there were 137 respiratory disease deaths. In January there were 9 days heavy fog and 592 deaths.

Meuse Valley, 1930. 60 deaths attributed to fog, the death rate rising to 10·5 times the normal. Many cattle had to be slaughtered.

London, 1948. Bronchitis deaths in week before fog, 73; in the week of fog, 148.

Donora, U.S.A., 1948. 18 deaths in a population of 14,000. 42 per cent of the population were estimated to have suffered from illness.

London, 1952. The fog developed on Friday, 5th December and continued until 8th December. Estimated total of 4,000 deaths in the Greater London area. In the Administrative County only deaths from bronchitis rose from 121 to 872, and from heart and circulatory diseases, from 318 to 801.

London, 1956. 1,000 additional deaths attributed to January fog in the Greater London area. (*B.M.J.*, 31 *March*, 1956.)

London, 1962—Fog in London and other areas, December 3-7, with similarities to the 1952 fog, but with 750 additional deaths as compared with 4,000.

Principal References

Mortality and Morbidity during the London Fog of December, 1952. Ministry of Health Public Health Report No. 95. (This report contains a section on "Previous Fog Incidents," with a statistical appendix for those in London.)

Les Problèmes de Pollution de l'Atmosphère, Batta, Firket and Leclerc, Liége, 1937.

Air Pollution in Donora, Pa. Public Health Bulletin, No. 306, Federal Security Agency, Public Health Service, Washington.

The History of Air Pollution in Great Britain

A Chronological Table

1273	Use of coal prohibited in London as being "prejudicial to health."
1306	Royal Proclamation prohibiting artificers from using sea-coal in their furnaces. Record of the execution of one offender.
1307	Commission of Inquiry appointed to "inquire of all such who burnt sea-coal in the city or parts adjoining, and to punish them for the first offence with great fines and ransoms, and upon the second offence to demolish their furnaces."
1578	Queen Elizabeth I "findeth hersealfe greately greved and anoyed with the taste and smoke of the sea-cooles."
1648	Petition of Londoners to Parliament to prohibit the importation of coal from Newcastle on account of the injury they experienced.
1661	John Evelyn submitted his "Fumifugium, or the Smoake of London Dissipated," to Charles II.
1819	Committee appointed by Parliament to inquire how far persons using steam engines and furnaces could erect them in a manner less prejudicial to public health and comfort.
1843	A Select Committee recommended the introduction of a Bill dealing with nuisances from furnaces and steam engines.
1845	Another Select Committee reported that it was not desirable to extend the provisions of an Act beyond furnaces used for steam generation.

1847	The Town Improvement Clauses Act contained a section dealing with factory smoke.
1853-6	Smoke Abatement Acts relating to the Metropolitan area.
1866	The Sanitary Act empowered sanitary authorities to take action in cases of smoke nuisances.
1875	The Public Health Act containing a smoke abatement section on which legislation to the present day has been based.
1881	Smoke Abatement Exhibition at South Kensington organized by the Public Health and Kyrle Societies.
1882	Formation of the National Smoke Abatement Institution.
1891	The Public Health (London) Act.
1899	Formation of the Coal Smoke Abatement Society, led by Sir William Richmond, R.A. and Dr. H. A. Des Vœux (concerned mainly with London).
1909	Sheffield smoke abatement Exhibition, at which was set up the Smoke Abatement League of Great Britain (mainly for the provinces and centred later in Manchester and Glasgow).
1912	International smoke abatement Exhibition in London, organized by the Coal Smoke Abatement Society, leading to the formation of a Committee for the Investigation of Atmospheric Pollution.
1913	Smoke abatement Bill introduced in the House of Commons by A. G. C. Harvey, M.P.
1914	Smoke abatement Bill introduced in the House of Lords by Lord Newton. Withdrawn on the appointment of a Departmental Committee to investigate the problem.
1920	Committee re-formed after the war with Lord Newton as Chairman.
1921	Publication of the Final Report of the Newton Committee.
1926	Public Health (Smoke Abatement) Act by which the 1875 and 1891 Acts were amended and extended.
1927	Establishment of first regional committees of local authorities.
1929	Amalgamation of the Coal Smoke Abatement Society and Smoke Abatement League of Great Britain to form the National Smoke Abatement Society. First publication of a journal (now *Smokeless Air*) devoted to air pollution.
1936	Public Health Act, in which were included the provisions of the smoke abatement Act of 1926.
1946	Simon Report on Domestic Fuel Policy, recommending, *inter alia*, measures for domestic smoke prevention.
1946	First smokeless zone and prior approval legislation (Manchester Corporation Act).
1951	First smokeless zone established (in Coventry).
1952	Ridley Report on " Policy for the Use of Fuel and Power Resources," recommending, *inter alia*, measures for smoke prevention.
1952	London smog disaster, the most serious for many years, with a death roll of 4,000 (*q.v.*).
1953	Beaver Committee on Air Pollution set up by the Government and published an Interim Report.
1954	Final Report of the Beaver Committee.
1954	A Clean Air Bill introduced by Gerald Nabarro, M.P., and withdrawn (4th Feb., 1955) on Government undertaking to introduce their own Bill.
1955	Whole of City of London declared a smokeless zone.
1956	Clean Air Act.
1958	National Smoke Abatement Society became incorporated under new name of National Society for Clean Air.
1959	International Diamond Jubilee Clean Air Conference and Exhibition (NSCA), London.
1962	Smog episode in London and other cities. Estimated death roll of 750 in Greater London.
1962	Holborn M.B. first local authority in country to reach its final target under Clean Air Act.
1964	Amendments to Clean Air Act in Housing Act, 1964, modifying smoke control area policy. Clean Air Act (Northern Ireland).

Solid Smokeless Fuels

Solid Smokeless Fuels

Coke, or something akin to it is referred to in Chinese and Greek literature as early as 300/400 B.C.

In this country in the 16th century coke was made by "charking"; the details of the process are lost in antiquity, though it is thought that it must have been similar to that used to make charcoal. Primitive forms of the modern coke ovens were established about 100 years ago and the recovery of by-products began 1882.

Today solid smokeless fuels are made from many different processes, coke ovens, continuous vertical retorts, intermittent vertical retorts by low temperature carbonization processes by mild heat treatment and by the new fluidized char process.

All manufactured solid smokeless fuels are made for a specific purpose and vary in relation to their density, volatile matter and reactivity according to the class and quality of coal from which they are made. Fuels are carefully graded and sized and this together with their different characteristics makes them suitable for a wide range of domestic appliances.

The authorized solid smokeless fuels are as follows:—

1. Anthracite

Anthracite is obtained mainly from South Wales and is characterized by its hard and bright appearance and is distinguished by its high carbon and low volatile content.

It is a suitable fuel for room heaters, boilers and cookers in which it will burn for many hours without attention. The small sizes of Anthracite peas, beans or grains, are used on gravity feed boilers.

2. Briquetted Fuel Carbonized in the Process of Manufacture (Phurnacite)

Phurnacite is carbonized ovoids made from specially selected and prepared Welsh Dry Steam Coals.

Most of the volatile content is removed during the manufacturing process. The resulting smokeless ovoids burn for long periods without attention, are completely free of stone or shale and are suitable for use in room heaters, boilers and cookers.

The ovoids are extremely hard so that breakage and the formation of "fines" during transit is unlikely.

3. Coke

Barnsley BurnBrite

This fuel is manufactured in coke ovens from specially selected prepared coal at a low temperature and for a shorter period than other products from coke ovens and is suitable for the improved open fire. Smaller sizes can be burned in room heaters, boilers and cookers.

Barnsley BurnBrite is available in London, the Midlands, North Western, South Yorkshire Areas and parts of Scotland.

Gas Coke, Gloco, Sebrite

These fuels are produced by the carbonization of selected coals and are carefully prepared for use in open fires which are specified for use with coke and preferably fitted with gas ignition. These fuels will not burn in old-fashioned grates.

Gas Coke suitable for the open fire is manufactured in continuous vertical retorts and comes within this category. Smaller sizes of these fuels are suitable for room heaters, boilers and cookers.

Sebrite is manufactured only by the South Eastern and Eastern Gas Boards and is available only in South East England.

Sunbrite

Sunbrite is a hard coke produced by the carbonization of selected coals at a high temperature in coke ovens. It is carefully prepared and selected for domestic heating appliances.

It is manufactured by the National Coal Board, the Steel Companies and the Independent Coke Producers.

Sunbrite is suitable for use in room heaters, boilers and cookers, fires with under-floor primary air for combustion and fan assisted open fires.

Cleanglow and Phimax

These fuels are produced by different area gas boards in continuous vertical retorts from specially selected coals. Cleanglow is available in most parts of the country though Phimax is only available in the North West.

Cleanglow and Phimax are suitable for use on the open fire, are easy to ignite and burn with a flame.

4. Low Temperature Carbonized Fuels—Coalite and Rexco

Coalite and Rexco are manufactured from two different low temperature carbonization processes. They burn with a cheerful flame, are easy to ignite and are very reactive fuels. They are suitable for open fires; smaller sizes are suitable for room heaters, boilers and cookers.

5. Low Volatile Steam Coal

Low Volatile Steam Coal has a higher volatile content than Welsh Dry Steam Coal, has a high bulk density and the replenishment of the fire need not be so frequent as with the lighter fuels.

This fuel is suitable for room heaters, boilers and cookers, while Lovol is suitable for open fires.

6. Fluidized Char Binderless Briquettes

Homefire

Homefire is a six-sided briquette three inches in diameter and a quarter of an inch thick and has much the density of coal and a very low ash content.

It is a reactive fuel burning with a bright flame and is produced by the National Coal Board at Coventry. This fuel is suitable for open fires and at present is available in parts of the Midlands, the North West and the London area.

Roomheat

Roomheat is produced by a process similar to that of Homefire and is a cushion shaped briquette that burns with a long flame giving an attractive fire with low ash residual. It is manufactured by the National Coal Board at Markham near Doncaster. This fuel is suitable for room heaters and open fires.

7. Mild Heat Treatment Briquettes Multiheat

Mild heat treatment briquettes being produced at the Crown Fuel Works in Cardiff. They have anthracite as a main constituent and are manufactured by the National Coal Board.

Multiheat briquettes are ovoid in shape, strong and dense. This fuel is designed for use in room heaters, boilers and the improved open fire and supplies are available in London and the South West.

The Clean Air Case

A Synopsis for the Guidance of Speakers, Writers, Teachers, etc.

1. Historical Background. Growth of the air pollution problem and efforts to abate it, from 1273 to the present day. (*See History table.*)

2. Nature, Sources and Causes, Smoke: Due to incomplete combustion; consists of fine carbonaceous particles and tarry droplets. (For quantities produced, *see Table.*)

Gases: Sulphur dioxide the most harmful, especially when in association with smoke particles. Also carbon monoxide, and noxious gases and fumes from chemical processes. See the Society's Report on *Sulphur Dioxide as an Air Pollutant.*

Grit and dust: Mainly from industrial sources, e.g., pulverized coal and high-draught furnaces.

3. Extent and Behaviour of Pollution. Measurement of floating and deposited impurities, sulphur dioxide, and of light values. The Investigation under the Warren Spring Laboratory (*q.v.*)

4. Fog. Natural and smoke fogs, their formation and characteristics. The London, 1952, 1962, and other lethal smogs.

5. Effects. *Health:* Effects on respiratory system. Effects due to obstruction of natural light. Possible relationship with lung cancer. Psychological and social consequences of life in smoke-ridden environment. Effects of smog are the result of infrequent high concentration of pollution, whereas the insidious action of " normal " pollution takes place continuously.

Plant Life: Principal factors injurious to vegetation are: loss of sunlight, blocking of stomata by deposits, direct attack by chemicals, acidification of soil. Indirect effect on grazing animals through deterioration of herbage, or of poisoning in the case of fluoride pollution.

Materials: Corrosion or erosion of metals, stone, fabrics, leather, etc.

Visibility: Loss of visibility due to smoke haze and smog affecting air and surface transport.

Costs: See information on page 47

6. Prevention. *Industrial Smoke:* calls for correct equipment, maintenance and operation of plant. Value of mechanical stoking. Uses of oil, gas, electricity and smokeless solid fuel. Importance of training and certification of stokers. Instrumentation, smoke alarms, etc. Need for all-round fuel efficiency. *Dust and grit:* Use of arrestors of appropriate types: cyclones, wet washing, electrostatic precipitators. *Sulphur:* removal by coal washing, flue gas-washing and other possible means. Importance of high chimneys and emission velocity.

Domestic: By use of smokeless fuels—gas, electricity, oil or solid. *See article describing the types of solid smokeless fuel.* Need for efficient appliances. Central and district heating, whole-house warming, off-peak electrical methods, etc. Smoke control areas, purpose and national programme.

Railways and Roads: Use of diesels and electricity for the former. Need for efficient combustion and good maintenance in road vehicles, possible development of catalytic afterburners and other devices.

7. Policy, Law, etc. The present law —Clean Air Act, 1956, Public Health Act, 1936, local Acts, Road Traffic Act, 1930, Alkali, etc., Works Regulation Act, 1906, and Orders, etc. The Beaver Report and its proposals (*q.v.*). Responsibilities of local authorities and central Government. Smokeless zones and smoke control areas. Work of the Warren Spring Laboratory, Alkali Inspectorate and other organizations. Educational and publicity work of the National Society for Clean Air.

(*See also the new NSCA booklet "Clean Air Lecture Notes"*, 1*s.* 6*d.*)

Recent Books, Papers and Reports

A Selected List

Industrial

101st Annual Report on Alkali etc., Works for 1964. Chief Inspectors, pp. 76, H.M.S.O. 1965 (5s. 6d.).

102nd Annual Report on Alkali etc., Works for 1965. Chief Inspectors, pp. 82, H.M.S.O. 1966 (7s. 6d.).

Odour Control by Catalytic Combustion, Betz, E. Nat. Soc. for Clean Air Proc. Eastbourne Conf. 1965 (25s.).

Chimney Heights—Progress and Problems since the Memorandum. Beaumont, S. C. Nat. Soc. for Clean Air Proc. Eastbourne Conf. 1965 (25s.).

The Selection of Industrial Dust Collection Plant. Hodgson, J. Nat. Soc. for Clean Air Proc. Eastbourne Conf. 1965 (25s.).

Unresolved Problems in Air Pollution: Alkali and Works. Ireland, F. E. Nat. Soc. for Clean Air Proc. Eastbourne Conf. 1965 (25s.).

Fuel Economy 1966. Confederation of Brit. Industry (10s.).

Road Vehicles

Atmospheric Pollution: A Survey of some aspects of the emissions from petrol-engined vehicles and their treatment. British Technical Council of the Motor and Petroleum Industries, Lindley, Warwicks. September 1965 (£2).

Control of Air Pollution from New Motor Vehicles and New Motor Vehicle Engines. Federal Register, Vol. 31, No. 61, Part II. U.S. Dept. of Health, Education and Welfare. March 1966.

Air Pollution from Road Traffic—Measurements in Archway Road, London. Reed, L. E. and Barrett, C. F. Intern. Journ. Air Wat. Poll. 1965, Vol. 9, pp. 357–365. Pergamon Press.

Domestic

New Horizons in Domestic Heating. 4 Papers: Oil—Brewster, H. R. Gas—

Bruce, R. N. Solid Fuel—Reid, W. Off-Peak Electricity—Melling, C. T. Nat. Soc. for Clean Air Proc. Eastbourne Conf. 1965 (25s.).

Successes with Smoke Control. 3 Papers: Manchester—Richards, J. Sheffield—Batey, W. J. Scunthorpe—Allen, G. O. Nat. Soc. for Clean Air Proc. Eastbourne Conf. 1965 (25s.).

Heat Transfer and Condensation in Domestic Boiler Chimneys. National Building Studies, Research Paper 40. H.M.S.O. 1966 (10s. net).

Research and Investigation

Air Pollution from Power Stations. Craxford, S. R. Smokeless Air, No. 136, Winter 1965, 123–128 (3s.).

The Investigation of Atmospheric Pollution. Tables of Observations for the Year Ended March 1964. Warren Spring Laboratory, Gunnels Wood Road, Stevenage, Herts.

Selected Methods for the Measurement of Air Pollutants. U.S. Dept. of Health, Education and Welfare. May 1965. (Robert A. Taft Engineering Centre, Cincinnati, Ohio 45226) Public Health Service Publication No. 999-A-11.

Effects of Air Pollution

Vehicle Exhausts in Relation to Health. 3 Papers by Dr. L. E. Reed, H. D. Fawell, and Dr. P. J. Lawther, presented at a meeting of the Royal Society of Health, February 9, 1966 (R.S.H., 90 Buckingham Palace Road, London, S.W.1.).

Report on an Inquiry into the Incidence of Incapacity for Work. Part II: Incidence of Incapacity for Work in different Areas and Occupations. Ministry of Pensions and National Insurance. H.M.S.O. £2 2s.

Polluted Homes. Gregory, P. (Occasional Papers on Social Administration No. 15), pp. 64, publ. G. Bell & Sons, September 1965 (10s. 6d.).

A Recent Survey's Findings Concerning Air Pollution and Mortality from Lung Cancer and Bronchitis. Wicken, A. J. Nat. Soc. for Clean Air Proc. Eastbourne Conf. 1965 (25s.).

Air Pollution and the Public Health. Lawther, P. J., Journal of the Royal Society of Arts. September 1965, 745–757.

Fuel

A Fuel Policy for Britain. A P.E.P. Report. Pp. 236. Political and Economic Planning, London (50s.).

Planning Electricity in the House. Honey, P. Pp. 176, George Godwin, London (27s. 6d.).

Solid Fuel Distribution and Supply Problems. Papers by Otty, E. and Bourne, W. H. Nat. Soc. for Clean Air Proc. Eastbourne Conf. 1965 (25s.).

General

Education and Publicity for Clean Air. Marsh, A. (Smokeless Air, No. 136. Winter 1965, 138–144).

Restoring the Quality of our Environment. Report of the Environmental Pollution Panel President's Science Advisory Committee. November 1965. The White House, Washington, U.S.A.

Presidential Address. Wilson, Sir Alan. Nat. Soc. for Clean Air Proc. Eastbourne Conf. 1965 (25s.).

A Compilation of Selected Air Pollution Emission Control Regulations and Ordinances. U.S. Dept. of Health, Education and Welfare. Div. of Air Pollution, Cincinnati, Ohio. May 11th, 1965.

Heating and Ventilating Year Book, 1st Ed. 1966 (Stamford House, 65–66 Turnmill Street, London, E.C.1) (42s.).

Air Pollution. Smith, A. R. Monograph No. 22. Society of Chemical Industry, 14 Belgrave Square, London, S.W.1. 1966 (£3).

Guide to Publications

This list of available books, reports and pamphlets on smoke prevention, atmospheric pollution and fuel usage is issued by the National Society for Clean Air as a reference guide for readers. It may also be used for ordering the publications which may be obtained either direct from the Society, or other bookseller.

Prices in brackets include postage and packing, which must be included when ordering by post, except in the case of orders over £3, which will be sent post-free. If a number of items are ordered together excess postages will be refunded. Prices quoted are those current at the date of publication, and are subject to variation.

Information about older, out-of-print, and overseas publications may be obtained rom the Society on request. Most of these are in the Society's library and can be consulted, or in some cases borrowed for short periods, by arrangement.

Except where otherwise stated the publisher is the Society. H.M.S.O.—H.M. Stationery Office. The publications are numbered and orders to the Society may be made by the code number.

Legislation

Acts and Memoranda

Code No.

82. **Clean Air Act, 1956.** The latest Statute governing smoke, containing sections on dark smoke, smoke from furnaces, grit and dust from furnaces, smoke control areas, smoke nuisances, special cases, clean air council and miscellaneous provisions. (H.M.S.O., 1956) 4 & 5 Eliz. 2 Ch.52. 2s. (2s. 5d.)

83. **Clean Air Act, 1956.** Memorandum on Smoke Control Areas. (H.M.S.O., 1956) 1s. 3d. (1s. 6d.)

84. **Clean Air Act, 1956.** Memorandum on Miscellaneous Provisions. (H.M.S.O., 1956) 8d. (11d.)

85. **Amendment to Model Byelaws.** Series IV Buildings (1953) Edition. (H.M.S.O., 1956) 2d. (5d.)

80. **The Clean Air Act, 1956.** A Descriptive Summary. (N.S.C.A.) 4s. 6d. per dozen, post free. 6d. single copy.

105. **Thermal Insulation (Industrial Buildings) Act, 1957.** (5 & 6 Eliz. 2 Ch.40). (H.M.S.O., 1957) 6d. (9d.)

118. **Clean Air Act, 1956. Memorandum on Industrial Provisions.** (H.M.S.O., 1958) 1s. (1s. 3d.)

125. **Clean Air Act, 1956. Memorandum on Industrial Provisions (Scotland).** (H.M.S.O., 1959) 1s. (1s. 6d.)

187. **Clean Air Act, 1956. Memorandum on Chimney Heights.** (H.M.S.O., 1963) 1s. 3d. (1s. 6d.)

195. **Housing Act 1964.** (H.M.S.O.) 8s. 6d. (9s. 1d.)

196. **West Riding County Council (General Powers) Act, 1964.** (H.M.S.O.) 3s. (3s. 6d.)

197. **Clean Air Act (Northern Ireland) 1964. Belfast** (H.M.S.O.) 3s. 6d. (3s. 11d.)

Regulations (Statutory Instruments)

86. **Clean Air: The Smoke Control Areas (Authorized Fuels) Regulations, 1956.** Statutory Instruments, 1956 No. 2023. (H.M.S.O., 1956) 2d. (5d.)

104. **Clean Air Council Order, 1957.** Statutory Instruments No. 766, 1957. (H.M.S.O.) 3d. (6d.)

113. **Smoke Control Areas (Exempted Fireplaces) Order, 1957.** S.I. No. 541, 1957. (H.M.S.O.) 2d. (5d.)

115. **Alkali, etc., Works Order, 1958.** S.I. No. 497, 1958. (H.M.S.O.) 3d. (6d.)

117. **Dark Smoke (Permitted Periods) Regulations, 1958.** S.I. No. 498, 1958. 3d. (6d.)

119. **Dark Smoke (Permitted Periods) (Vessels) Regulations, 1958.** S.I. No. 878, 1958. (H.M.S.O.) 3d. (6d.)

120. **Clean Air Act, 1956 (Appointed Day No. 2) (Scotland) Order, 1958.** S.I. No. 1931, 1958. (H.M.S.O.) 2d. (5d.)

121. **Alkali, etc., Works (Scotland)**

Order, 1958. S.I. No. 1932, 1958. (H.M.S.O.) 3d. (6d.)

122. **Dark Smoke (Permitted Periods) (Scotland) Regulations, 1958.** S.I. No. 1933, 1958. (H.M.S.O.) 3d. (6d.)

123. **Dark Smoke (Permitted Periods) (Vessels) (Scotland) Regulations, 1958.** S.I. No. 1934, 1958. (H.M.S.O.) 3d. (6d.)

137. **Smoke Control Areas (Exempted Fireplaces) Order, 1959.** S.I. No. 1207, 1959. (H.M.S.O.) 3d. (6d.)

139. **Smoke Control Areas (Exempted Fireplaces) (Scotland) Order, 1959.** S.I. No. 2264 (S.123), 1959. (H.M.S.O.) 3d. (6d.)

174. **Alkali, etc., Works Order, 1961.** S.I. No. 2261, 1961. (H.M.S.O.) 3d. (6d.)

176. **Alkali, etc., Works Order, 1963.** S.I. No. 493, 1963. (H.M.S.O.) 5d. (8d.)

191. **Clean Air: The Smoke Control Areas (Authorized Fuels) Regulations 1963.** S.I. No. 1275, 1963. (H.M.S.O., 1963) 3d. (6d.)

198. **The Alkali etc., Works (Scotland) Order, 1965.** S.I. No. 478 (S.23) 1965. (H.M.S.O.) 9d. (1s.)

199. **The Motor Vehicles (Construction and Use) Regulations 1963.** S.I. No. 1646, 1963. (H.M.S.O.) 4s. 6d. (4s. 11d.)

200. **The Motor Vehicle (Construction and Use) (Amendment) Regulations 1964.** S.I. No. 631 1964 (H.M.S.O.) 3d. (6d.)

201. **The Motor Vehicles (Construction and Use) (Amendment) (No. 2) Regulations 1964.** S.I. No. 1169, 1964. (H.M.S.O.) 1s. (1s. 3d.)

202. **The Motor Vehicles (Construction and Use) (Amendment) (No. 3) Regulations 1964.** S.I. No. 1679, 1964. (H.M.S.O.) 3d. (6d.)

203. **The Motor Vehicles (Construction and Use) (Amendment) (No. 4) Regulations 1964.** S.I. No. 1958, 1964. (H.M.S.O.) 3d. (6d.)

204. **The Building Standards (Scotland) Regulations, 1963.** S.I. No. 1897 (S. 102) 1963. (H.M.S.O.) 11s. 6d. (12s. 2d.)

219. **The Smoke Control Areas (Exempted Fireplaces) (Scotland) Order 1965.** S.I. No. 1284 (S.57) (H.M.S.O.) 3d. net

220. **The Smoke Control Areas (Authorised Fuels) Regulations 1965.** S.I. No. 1508 (H.M.S.O.) 3d. net

221. **The Smoke Control Areas (Exempted Fireplaces) Order 1966.** S.I. No. 217 (H.M.S.O.) 3d. net

222. **The Smoke Control Areas (Exempted Fireplaces) (Scotland) Order 1966.** S.I. No. 715 (S.46) (H.M.S.O.) 5d. net

223. **The Smoke Control Areas (Authorised Fuels) (Scotland) Regulations 1966.** S.I. No. 714 (S.45) (H.M.S.O.) 3d. net

Circulars

124. **Smoke Control Areas.** Circular No. 5/59 (26/1/1959). (H.M.S.O.) 6d. (9d.)

138. **Exempted Fireplaces Order, 1959.** Circular No. 44/59 (16/7/1959). (H.M.S.O.) 3d. (6d.)

164. **Use of Sticks and Paper in Smoke Control Areas.** Circular No. 28/60 (7/7/60). (H.M.S.O.) 9d. (1s.)

166. **Notification of Provisional Plans for establishing Smoke Control Areas.** Circular No. 1/61 (16/1/1961) (H.M.S.O.) 3d. (6d.)

167. **Air Pollution—Measurement and Research.** Circular No. 12/61 (10/4/1961) (H.M.S.O.) 3d. (6d.)

168. **Selection of Open Fires for Coke Burning.** Circular No. 28/61 (5/6/1961) (H.M.S.O.) 3d. (6d.)

169. **Works of Adaptation Eligible for Grant.** Circular No. 31/61 (26/6/1961) (H.M.S.O.) 3d. (6d.)

170. **Industrial Furnaces.** Circular No. 42/61 (29/8/1961) (H.M.S.O.) 2d. (5d.)

171. **Smoke Control in the Black Areas.** Circular No. 4/62 (30/1/1962) (H.M.S.O.) 5d. (8d.)

172. **Smoke Control Areas.** Circular No. 3/62 (30/1/1962) (H.M.S.O.) 1s. (1s. 3d.)

177. **Alkali, etc., Works Regulation Act, 1906.** Circular No. 23/63 (22/3/63) (H.M.S.O.)

178. **"Homes for Today and Tomorrow".** Circular No. 13/62 (H.M.S.O.) (12/2/62) 3d. (6d.)

179. **Fuel Storage in New Local Authority Housing.** Circular No. 50/62 (1/10/62) (H.M.S.O.) 3d. (6d.)

180. **Smoke Control Programmes, 1962-1966.** Circular No. 60/62. (18/12/62) (H.M.S.O.) 3d. (6d.)

181 **Gas Cokes as Open Fire Fuels,** Circular No. 7/63 (2/4/63) (H.M.S.O.) (8d.)

188. **Chimney Heights.** Circular No. 25/63 (15/5/63) (H.M.S.O.) 3d. (6d.)

190. **Smoke Control Areas.** Circular No. 69/63. (17/12/63) (H.M.S.O.) 1s. (1s. 3d.)

205. **Housing Act 1964. Section 95: Amendment of the Clean Air Act 1956.** Circular No. 46/64 (14/8/64) (H.M.S.O.) 5d. (8d.)

206. **Housing Act 1964. Designation of Direct Acting Electric Space-Heaters.** Circular No. 60/64 (18/12/64) (H.M.S.O.) 3d. (6d.)

207. **Disposal of old Motor Vehicles.** Circular No. 8/65 (11/2/65) (H.M.S.O.) 9d. (1s.)

208. **Smoke Control Areas: Supplies of Solid Smokeless Fuel.** Circular No. 13/65 (17/3/65) (H.M.S.O.) 9d. (1s.)

209. **Heating of Public Buildings.** Circular No. 46/65. (2/6/65) (H.M.S.O.)

Smoke Control Areas: Grant Arrangements. Circular No. 51/65. (29/6/65) (H.M.S.O.)

224. **Tall Buildings and Industrial Emissions.** Circular No. 69/65 (18/10/65) (H.M.S.O.) 3d. net

225. **Smoke Control Areas: Estimates and Final Costs.** Circular No. 77/65 (31/12/65) (H.M.S.O.) 9d. net

226. **Smoke Control Areas (Authorised Fuels) (No. 2) Regulations 1965.** Circular No. 18/66 (16/3/66) (H.M.S.O.) 3d. net

Other Government Publications

58. **Committee on Air Pollution.** The Interim Report of the Beaver Committee appointed in July, 1953, to examine the nature, causes and effects of air pollution and the efficiency of present preventive measures; to consider what further preventive measures are practicable; and to make recommendations. (Cmd. 9011.) (H.M.S.O., 1953.) 2s. 6d. (2s. 11d.)

71. **Committee on Air Pollution.** The Final Report of the Beaver Committee. (Cmd. 9322). (H.M.S.O., 1954.) 5s. 6d. (5s. 11d.)

92. **Mortality and Morbidity During the London Fog of December, 1952.** Ministry of Health, Reports on Public Health and Medical Subjects, No. 95. (H.M.S.O., 1954.) 2s. 6d. (2s. 11d.)

132. **The Efficient Use of Fuel.** (H.M.S.O., for Ministry of Power). 35s. (37s.)

44. **Housing Manual, 1949.** The official recommendations on housing practice. The section on the heat installation may be regarded as the basis of present-day smoke prevention policy. (H.M.S.O., 1949)

155. **Report of the Committee on Solid Smokeless Fuels.** (Cmd. 999, H.M.S.O., 1960). 1s. 3d. (1s. 6d.)

The Investigation of Atmospheric Pollution. Reports by the Fuel Research or Warren Spring organization of the Department of Scientific and Industrial Research, co-ordinating local observations of atmospheric pollution.

75. **27th Report (1944-54).** (H.M.S.O., 1955.) 7s. 6d. (8s. 2d.)

106. **28th Report (1954-55).** (H.M.S.O., 1957.) 5s. 6d. (6s. 1d.)

134. **29th Report (1955-56).** (H.M.S.O., 1958.) 7s. (7s. 8d.)

135. **30th Report (1956-57).** (H.M.S.O., 1959). 7s. 6d. (8s. 2d.)

182. **Smoke Control (England and Wales) 1962-1966.** Summary of programmes of local authorities for establishment of Smoke Control Areas. (Cmnd. 1890, H.M.S.O.) 3s. 6d. (3s. 9d.)

189. **Domestic Fuel Supplies and the Clean Air Policy.** (Presented to Parliament by the Minister of

Power, December, 1963). (Cmnd. 2231, H.M.S.O.) 1s. 6d. (1s. 9d.)

100th Annual Report on Alkali etc., Works for 1963. Chief Inspectors, pp. 84, H.M.S.O. 1964. 5s. 6d. (6s.)

227. **101st Annual Report on Alkali etc., Works for 1964.** Chief Inspectors, pp. 76, H.M.S.O., 1965 (5s. 6d.)

228. **102nd Annual Report on Alkali etc., Works for 1965.** Chief Inspectors, pp. 82, H.M.S.O., 1966. (7s. 6d.)

General

11. **Smoke: The Problem of Coal and the Atmosphere.** Arnold Marsh. A comprehensive textbook on the causes, consequences and means for prevention of smoke. Illustrations and bibliography. (Faber and Faber Ltd., 1947.) 21s. (21s. 9d.)

13. **Smokeless Air.** The Society's quarterly magazine-type journal. News, articles, photographs, comment. 12s. per annum, post free 3s. (3s. 5d.)

131. **Air Pollution.** Ed. M. W. Thring. (Butterworths.) 42s. (43s.)

15. **Fumifugium or the Smoake of London Dissipated.** John Evelyn. The famous diarist's well-known tract (1661) reprinted by the Society. Special tercentenary issue. Cloth bound 5s. (5s. 6d.). Paper back 2s. 6d. (2s. 9d.).

142. **New Stoker's Manual.** (National Industrial Fuel Efficiency Service.) 2s. 6d. (2s. 11d.)

183. **Air Pollution.** Edited by Arthur G. Stern. In 2 vols., pp. 656 and 586. Academic Press, New York and London. Vol. 1 (143s.). Vol. 2. (132s.).

193. **Smoke Inspector's Handbook** by A. Coe and I. M. Coe, from Clean Air Information Service, The College of Fuel Technology, 90 Talbot Road, London, N.6. Volume 1: 40s.; Volume 2: 50s. (post free).

194. **The Control of Air Pollution.** Alan Gilpin. pp. 514. Royal 8vo. London, Butterworths. 120s.

210. **Atmospheric Pollution: Its Origins and Prevention.** Meetham, A. R., in collab. with Bottom, D. W. and Cayton, S. 3rd revised edition. pp. 301, Pergamon Press, Oxford. 70s. net.

211. **Clean Air—Law and Practice.** Garner, J. F. and Crow, R. K. pp. 385, Shaw & Sons, London. 63s.

212. **Gas Purification Processes.** Ed. by G. Nonhebel, pp. 894, George Newnes, London. £7 net.

229. **Air Pollution.** Smith, A. R. Monograph No. 22, Society of Chemical Industry, 14 Belgrave Square, London, S.W.1. 1966. £3

Conference Proceedings

(Details of earlier Conference Proceedings available on request)

61. **Glasgow Conference, 1953.** The Des Vœux Memorial Lecture—"Atmospheric Pollution in Relation to Preventive Medicine," and papers on the London Fog Disaster, Smokeless Zones, Production, Use and Availability of Solid Smokeless Fuels and the Efficient and Smokeless Combustion of Fuel Oils. 7s. 6d. (7s. 11d.)

70. **Scarborough Conference, 1954.** The Des Vœux Memorial Lecture—"Air Pollution and Plant Life," Address by Sir Hugh Beaver, Presidential Address: "The Coal Crisis and the Society," papers on Rail Transport and Smoke Abatement, the Industrial Uses of Gas and the Industrial Uses of Electricity. 7s. 6d. (7s. 11d.)

87. **Southport Conference, 1956.** The Des Vœux Memorial Lecture—"Clean Air: The Next Chapter," Presidential Address, Progress Reports, Local Authorities and the Clean Air Act, Clean Air and the Housewife. 12s. 6d. (12s. 11d.)

98. **Hastings Conference, 1957.** The Des Vœux Memorial Lecture—"Meteorology and Air Pollution," Address by the Minister of Power, Lord Mills, Presidential Address, and papers on the Administration of the Clean Air Act, Industry and the Clean Air Act, and Pollution from Road Vehicles. 12s. 6d. (12s. 11d.)

126. **Llandudno Conference, 1958.** The Des Vœux Memorial Lecture—

"Clean Air, Urban Amenity, and the Growth of Towns," Address by the Minister of Housing and Local Government, Presidential Address, Industrial Aspects of the Clean Air Act, Forum on Smoke Control Areas, and papers on Air Pollution in London and its Smokeless Zones, Air Pollution and Respiratory Disease, Hazards from Airborne Radioactive Matter, and An Automatic Stoker for Central Heating 12s. 6d. (12s. 11d.)

140. **London, 1959: Diamond Jubilee International Clean Air Conference.** Containing Opening Address by Sir Graham Sutton, F.R.S.; 78 Papers on National Air Pollution Problems, Legislation, Education; Technical Problems; Observations, Investigation and Measurement; Research and International Co-operation; Discussions and Authors' Replies. 30s. (32s. 6d.). (Reprints available of some of the Papers).

144. **Harrogate Conference, 1960.** The Des Vœux Memorial Lecture—"Clean Air, Public Opinion and the Press," Address by Parliamentary Secretary, Ministry of Housing and Local Government, Series of progress reports on (1) Research and Investigation; (2) Domestic Heating; (3) Industrial Problems, Papers on Air Pollution from Road Vehicles, and an Inquiry into the Working of the Clean Air Act. 25s. (25s. 8d.)

175. **Brighton Conference, 1961.** Opening Address by John C. George, Parliamentary Secretary, Ministry o Power. Presidential Address by Lord Cohen of Birkenhead. Reports on National Survey of Air Pollution, Furnace Operators Bill, Diesel Smoke; Papers on Industrial Aspects of the Clean Air Act, Whole House Heating, Smoke Control Areas and Transatlantic Discussion. 15s. (15s. 7d.)

213. **Harrogate Conference 1962 (Pre-Prints only).** Presidential Address by Lord Cohen of Birkenhead. Three technical papers on pollution control in the steel industry, at coking plants and from iron foundry cupolas; International Session; the 1958 Alkali Order Processes; Domestic Smoke "Questions and Answers"; Incineration and Waste Disposal. 5s. (5s. 3d.)

214. **Harrogate Conference 1964** Opening Address by the Rt. Hon. Lord Sherfield. Presidential Address by Dr. Albert Parker. Smoke Control Area Reports from 8 regions; two papers on Air Pollution and Town Planning, four papers on the future supply of smokeless fuels; Des Vœux Memorial Lecture "A Century of Achievement"; a paper on road vehicle pollution and discussion on the Sulphur Dioxide Report. 25s. (25s. 6d.)

230. **Eastbourne Conference 1965.** Opening Address by John Morris, M.P., Parliamentary Secretary, Ministry of Power. Presidential Address by Sir Alan Wilson, F.R.S. Three Reports on Successes with Smoke Control; two papers on solid fuel distribution and supply problem; air pollution and mortality; odour control; control of pollution from road vehicles; four papers on new horizons in domestic heating; two papers on industrial problems; two papers on unresolved problems in air pollution. 25s. (25s. 6d.)

Reprints:

Des Vœux Memorial Lectures

45. **Towards the Better Use of Coal.** Dr. D. T. A. Townend, 1950. 2s. 6d. (2s. 9d.)

77. **Air Pollution and Plant Life.** Sir Edward Salisbury, 1954. Preprints only. 6d.

78. **The Destructive Effects of Air Pollution on Materials.** Dr. A. Parker. 1955. 1s. (1s. 3d.)

102. **Meteorology and Air Pollution.** Sir Graham Sutton, 1957. 1s. (1s. 3d.)

130. **Clean Air, Urban Amenity and the Growth of Towns.** Sir William Holford, 1958. 1s. (1s. 3d.)

152. **Clean Air, Public Opinion and the Press.** Sir Linton Andrews, 1960. 1s. (1s. 3d.)

214. **A Century of Achievement.** J. S. Carter, 1964. (In Proceedings of 1964 Harrogate Conference and *Smokeless Air* No. 132, Winter 1964).

Other Reprints

145. **Some factors concerning Diesel Engine Exhaust Fumes.** J. K. Lock, 1960. 1s. (1s. 3d.)

146. **Methods of Removing Smoke from Road Vehicles.** L. E. Reed and S. C. Wallin, 1960 1s. (1s. 3d.)

147. **Sampling for 3:4 Benzpyrene in Flue Gas from Plant fired by Petroleum Fuels.** E. L. Howe, 1960. 1s. (1s. 3d.)

148. **Trends in the Pollution of the Air of Gt. Britain, 1952-59.** J. Carroll, S. R. Craxford, H. E. Newall, P. M. Weatherley, 1960. 1s. 3d. (1s. 6d.)

149. **Pollution Levels in Cities.** F. P. Williams, 1960. 1s. (1s. 3d.)

150. **Accuracy and Reliability of Instruments in Common Use for Measurement of Air Pollution.** S. R. Craxford, E. T. Wilkins, D. W. Slimming, 1960. 1s. (1s. 3d.)

151. **Reports on an Inquiry into the Working of the Clean Air Act, 1960.** 2s. 6d.

165. **Air Pollution from Road Vehicles.** Reprint of Papers and Discussions, 1960. 3s. (3s. 3d.)

185. **Mitigation of Air Pollution at Coking Plants.** R. L. Cooper and J. P. Graham, 1962. 1s. (1s. 3d.)

186. **Incineration and Waste Disposal.** S. Cayton, 1962. 1s. (1s. 3d.)

215. **Power Stations and Clean Air.** G. N. Stone and A. J. Clarke. 1963. 1s. (1s. 3d.)

216. **Air Pollution and Town Planning.** S. R. Craxford and M-L. P. M. Weatherley. 1964. 1s. (1s. 3d.)

231. **Solid Fuel Distribution and Supply Problems.** W. H. Bourne, 1965.

232. **Odour Control by Catalytic Combustion.** E. Betz, 1965.

Miscellaneous

93. **Ringelmann Smoke Chart** (with instructional leaflet). Chart for measuring smoke density. (Charles Griffin & Co. Ltd.)
1s. 2d. each, 3 for 2s. 6d., 6 for 4s. 2d., 12 for 7s. 2d., including postage.

112. **'Power's' Microringelmann.** Direct facsimile reduction of the standard Ringelmann Chart (McGraw-Hill, 1954.)
Single copies, 2s. 6d. (2s. 9d.)
27s. 6d. per dozen, post free.

217. **Sulphur Dioxide.** An Examination of Sulphur Dioxide as an Air Pollutant by the Technical Committee of the Nat. Soc. for Clean Air. 2s. (2s. 3d.)

218. **Clean Air.** Notes for Teachers and Lecturers. National Society for Clean Air. 1s. 6d. (post free)

Clean Air Wall Chart (with Notes for Teachers, as above). From Educational Productions Ltd., 17 Denbigh Street, London, S.W.1. 2s.

Films and Filmstrips

Following is a list of films and filmstrips on air pollution and its prevention, fuel efficiency, etc. Application for the loan of the films (or purchase of the filmstrips) should be made to the issuing organization, referred to in the list by its initials, the key to which is given at the end of the list. Most of the films are available free, but the question of charges should be settled with the issuing organization, to whom 2-3 weeks advance notice of hire should be given. The running time in minutes is shown. Unless otherwise indicated, the films are available in both 16 and 35 mm. sizes, with sound.

The Society welcomes information on other films suitable for inclusion in future editions of the Year Book.

Films

GENERAL AND EDUCATIONAL

Family Album. The problems of domestic life confronting successive generations of a middle-class family from 1851-1965. 30 mins. G.C.

The Future is Electric. The place of nuclear power in smoke abatement. 28 mins. E.D.A.

The A.B.C. of Gas. An animated cartoon designed for the younger age groups, showing the evolution of coal from the prehistoric forests to its modern conversion into gas, coke and other products. 9 mins. G.C.

The First Mile Up. The experience of cities in North America making vigorous efforts to combat air pollution. Smoke prevention in Toronto. Particularly well illustrated. 16 mm. 28 mins. N.F.B.C.

DOMESTIC AND SMOKE CONTROL AREAS

The Stockton Test. An account of the conversion of four sub-standard houses to modern standards of heating, etc. 20 mins. A.I.L.

Window to the Sky. Excellent colour film, showing technique of setting up smoke control area. Suitable for general publicity, and for showing to members of local authorities. 22 mins. G.C.

Clean Air. Colour film dealing with air pollution and showing how modern methods of domestic heating meet the requirements of the Clean Air Act. 22 mins. S-M & BP.

Arthur Clears the Air. A film in colour intended for showing at meetings where the Clean Air Act and Smokeless Zones are discussed. 27 mins. N.C.B.

French Architecture and Modern Heating. Modern solid fuel heating systems in a wide range of applications to buildings all over France are featured in this colour film which has been adapted in English by the N.C.B. Film Unit. 27 mins. N.C.B.

People Like Us. An amusing colour film about solid fuel home-heating. N.C.B.

Heating Research for Houses. A record of the important research experiment at Abbots Langley, Herts., into ways of heating houses. 28 mins. C.F.L.

Report from America: Smog. Concerted action by the inhabitants of Pittsburgh, Pennsylvania, at one time gravely affected by industrial and domestic air pollution, has eventually rid the city of lethal "smog" and ensured a pure atmosphere. This film gives an account of their campaign. 30 mins. C.F.L.

Housewarming. "The Bartons" decide to install solid smokeless fuel central heating. 17 mins. N.C.B. (In colour).

It Takes Your Breath Away. The need to speed up the implementation of the Clean Air Act is emphasized. Contains a vividly compelling sequence on the health aspects. 16 mm. 16 mins. B.M.A.

Gas in Modern Housing. Stresses the need to incorporate clean air principles in new house design. 16mm. 18 mins. G.C.

FUEL, POWER AND INDUSTRIAL

Fluidized Coal Carbonization and Hot Briquetting. To provide sufficient smokeless fuels to meet the increasing demand, the N.C.B. Coal Research Establishment has developed a new smokeless fuel. 12 mins. N.C.B.

Homefire. Smokeless fuel for the open fire. Based on small-sized smoky coal the new smokeless fuel is now in quantity production at Birch Coppice. The manufacture of the briquettes is explained non-technically. 12 mins. N.C.B. (In colour).

Using the Coal. Shows various uses of coal, and its place among modern sources of energy. 37 mins. 16 mm. only. N.C.B.

Mechanical Firing of Coal. A group of six colour films presenting the main types of mechanical stoker. Total length 60 mins. N.C.B.

Coal: Our Wasting Asset. This film deals with fuel efficiency, fuel conservation and the problem of smoke. 10 mins. N.C.B.

Saharan Venture. Methane gas from the Sahara is helping to provide Britain with abundant supplies of clean fuel. This film tells the story of the venture in colour. 28 mins. G.C.

The Methane Story. A longer version of the above film made for the benefit of specialists. Emphasizes the methods and techniques employed. Colour, 16 mm. 28 mins. G.C.

Clearing the Air. In many districts much more remains to be done if the Act is to be effective. This film shows the contribution of the Gas Industry to progress. Colour. 12 mins. G.C.

Oil Fuel Combustion. Shows effects of bad firing and inefficient fuel combustion. Set in a destroyer at sea. 29 mins. 16 mm. only, silent. C.F.L.

Combustion. Production of coal from wood, use in various forms and application. 32 mins. 16 mm. only, sound. I.C.

Burning Your Fuel. Shows how simply heat is lost, and methods of prevention. 10 mins. 16 mm. only. N.I.F.E.S.

Firing Your Fuel. Mechanical firing for solid smokeless fuels. 8 mins. 16 mm. only. N.I.F.E.S.

Project—Halton Fields. Features a modern housing estate where developers have used domestic oil fired central heating on a district level. Colour. 20 mins. S-M & B.P.

Atomization. Discusses the technical aspects of combustion of oil fuels. 17 mins. S-M & B.P.

Combustion and the Chain Grate Stoker. Shows chemical and physical principles of coal, combustion, and their application in chain grate stoker. 25 mins. B. & W.

Pulverized Fuel. Deals with principles of pulverized fuel use. 40 mins. B. & W.

Industrial Electric Heating. Colour film on the use of electricity for industrial heating processes. 30 mins. E.D.A.

You and Your Fuel. This film attempts to show the many variations in the quality of coal, due to natural causes and why all the dirt and water cannot be removed before the coal is delivered to the customer. 16 mm. only. N.I.F.E.S.

You and Your Diesel. The importance of maintenance for diesel-engined lorries and tractors. In colour. 35 mins. S-M. & B.P.

Combustion. An instructional film for service engineers and boilerhouse staff. 30 mins. J.H.

Steam and Steam Generation. Film deals with the properties of steam, early boiler design and the modern steam generator design. 16 mm. silent. 31 mins. I.C.

Running the Low Ram Stoker. Shows the operational technique for the Low Ram Coking Stoker. 16 mm. 25 mins. J.H.

Synchromatic. Deals with a new revolutionary under feed stoker showing the working in detail. Colour. 16mm. 8 mins. J.H.

Gas Flow. Research into the effects of various types of flue baffles and bridge heights. 16 mm. 7 mins. J.H.

Air Flow. Experiments on the hydraulic flow model applied to the Chain Grate stoker. 16 mm. 9 mins. J.H.

The Properties of Coal. Explains difference between various coal gradings. Explanation of swelling number. 16 mm. 18 mins. J.H.

Key to Issuing Organizations:

A.I.L.—Allied Ironfounders Ltd., Brook Street, London, W.1.
B.M.A.—British Medical Association, Film Library, Tavistock Square, London, W.C.1.
B. & W.—Babcock & Wilcox Ltd., Babcock House, 209 Euston Road, London, N.W.1.
C.F.L.—Central Film Library, Government Buildings, Bromyard Avenue, Acton, London, W.3.
E.D.A.—Electrical Development Association, 2 Savoy Hill, London, W.C.2.
G.C.—The Gas Council, Hyde Park House, 4-5 Grosvenor Place, London, S.W.1.
I.C.—International Combustion Ltd., 19 Woburn Place, London, W.C.1.
J.H.—James Hodgkinson (Salford) Ltd., Brettenham House, Lancaster Place, Strand, London, W.C.2.
N.C.B.—National Coal Board, Film Department, 26-28 Dorset Square, London, N.W.1.
N.F.B.C.—National Film Board of Canada, 1 Grosvenor Square, London, W.1.
N.I.F.E.S.—National Industrial Fuel Efficiency Service, 71/72 Grosvenor Street, London, W.1.
S-M. & B.P.—Shell-Mex and B.P. Ltd., Public Relations Films, Shell-Mex House, Strand, London W.C.2.

Film Strips

Air Pollution. Black and white. Prepared in consultation with Association of Public Health Inspectors. General survey of problem, methods of measurement, etc. (prepared by Camera Talks). Available from Society, complete with lecture notes, price 2 guineas. (Quote Ref. No. CT.58). Also **The Public Health Inspector.** Colour. £2 12s. 6d. (Quote Ref. No. CT.24).

The Role of Industry. Colour. Deals with the general problem, illustrates plant and appliances for preventing smoke and grit. (Prepared by Camera Talks in conjunction with Association of Public Health Inspectors). Available from Society, complete with lecture notes, £2 12s. 6d.

Smoke Control Areas. Colour. Deals with setting up of smoke control areas. Suitable for general public, officers and members of local authorities. (Prepared by Camera Talks in conjunction with Association of Public Health Inspectors). Available from Society, complete with lecture notes, £2 12s. 6d.

Air Pollution. (A) Its nature, production and effects, and (B) its dispersion and accumulation. Two film strips in colour, each containing 32 frames. Script by R. S. Scorer, PH.D. Foreword by Sir Hugh Beaver. (Prepared by Diana Wyllie Ltd.). Available from Society, price £4 the pair. (Quote Ref. No. DW.F.22/23).

Chronic Bronchitis. Colour. Shows effects of Air Pollution in causation of Bronchitis. Lecture notes by Dr. J. L. Burn, with Appendix on Air Pollution. (Diana Wyllie Ltd., in co-operation with Pfizer Ltd.). Available from the Society, price £2.

The Clean Air Act and Oil Fuel. Semi-animated film strip in colour. 16 mm. sound. For use on film projector. Outlines position of oil fuel in relation to Clean Air Act. Available on loan from Public Relations Department, Shell-Mex and B.P. Ltd., Shell-Mex House, Strand, London, W.C.2.

Good-Bye Smog. An illustrated talk using a series of 2 in. x 2 in. slides; covers all aspects of the Clean Air Act and gives valuable advice on fuels, grants and appliances. Inquiries to:- The Women's Advisory Council on Solid Fuel, 18 South Molton Street, London, W.1.

DIRECTORY OF ORGANIZATIONS

with Air Pollution Interests

Great Britain

Alkali Inspectorate:
Chief Inspector, Ministry of Housing and Local Government. Whitehall, London, S.W.1. (Victoria 8540. Ext. 9).
Deputy Chief Inspectors, Ministry of Housing and Local Government, Whitehall, London, S.W.1. (Victoria 8540. Ext. 574 and 575.)
Chief Inspector for Scotland, Scottish Development Department, 43 Jeffrey Street, Edinburgh, 1. (Waverley 8433).

Architects and Surveyors, Incorporated Association of, 29 Belgrave Square, London, S.W.1. (Belgravia 3755).

Architects, Royal Institute of British, 66 Portland Place, London, W.1. (Langham 5533).

Arts, Royal Society of, 6-8 John Adam Street, London, W.C.2. (Trafalgar 2366).

Bristol and West Clean Air Committee, Public Health Inspectors' Department, Bluecoat House, Sawclose, Bath, Somerset. (Bath 5411).

British Industrial Measuring and Control Apparatus Manufacturers' Association, 23/24 Margaret Street, London, W.1. (Langham 9336).

British Ironfounders' Association, 30 St. James's Square, London, S.W.1. (Whitehall 6866).

British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1. (Euston 4499).

British Standards Institution, British Standards House, 2 Park Street, London, W.1. (Mayfair 9000).

British Steel Castings Research Association, The, East Bank Road, Sheffield, 2. (Sheffield 28647).

Building Centre, The, 26 Store Street, London, W.C.1. (Museum 5400).

Building Research Station, Bucknalls Lane, Garston, Watford, Herts. (Garston, Herts. 4040).

Cast Iron Research Association, British, Bordesley Hall, Alvechurch, Birmingham. (Redditch 2715).

Central Electricity Generating Board, Sudbury House, 15 Newgate Street, London, E.C.1. (City 1202).

Chemical Engineers, Institution of, 16 Belgrave Square, London, S.W.1. (Belgravia 3647).

Chemistry, Royal Institute of, 30 Russell Square, London, W.C.1. (Langham 3482).

City and Guilds of London Institute, 76 Portland Place, London, W.1. (Langham 3050).

Civic Trust, Walter House, Bedford Street, Strand, London, W.C.2. (Temple Bar 5202).

Civil Engineers, Institution of, Great George Street, London, S.W.1. (01-839 3611).

Clean Air Council, Ministry of Housing and Local Government, Whitehall, London, S.W.1. (Victoria 8540, Ext. 681).

Clean Air Council for Scotland, Scottish Development Department, 43 Jeffrey Street, Edinburgh, 1. (Waverley 8433).

Clean Air, National Society for:
Central Offices: Field House, Breams Buildings, London, E.C.4. (Chancery 5038).
East Midlands Division: "Sandygate", Bramcote Lane, Wollaton, Nottingham. (Nottingham 284873).
North-East Division: Health and Social Services Department, Civic Centre, Barras Bridge, Newcastle-upon-Tyne, 1. (Newcastle 28520).
North-West Division: Health Department, Ryecroft Hall, Audenshaw, Lancs. (Droylsden 1355).
Northern Ireland Division: Public Health Department, 414 Ormeau Road, Belfast, 7. (642905).
Scottish Division: 73 John Street, Glasgow. (Glasgow Central 9600. Ext. 2430).
South East Division: Public Health Department, Drayton Hall, West Drayton, Middx. (West Drayton 2275).
South Wales and Monmouthshire Division: 9 Lodge Drive, Baglan, Port Talbot, Glam. (Port Talbot 2244 Ext. 45).

South West Division: St. Clement's House, Marsh Street, Bristol, 1. (Bristol 26241).

West Midlands Division: Public Health Inspector's Office, Municipal Buildings, Old Hill, Staffs. (Cradley Heath 66891).

Yorkshire Division: Public Health Department, 12 Market Buildings, Vicar Lane, Leeds, 1. (Leeds 30211. Ext. 29).

Coal Board, National, Hobart House, Grosvenor Place, London, S.W.1. (Belgravia 2020).

Coal Utilisation Council, 19 Rochester Row, London, S.W.1. (Victoria 2339).

Coal Utilisation Research Association, British, Randalls Road, Leatherhead, Surrey. (Leatherhead 4411).

Coke Distributors' Associations, National Federation of, Terminal House, 52 Grosvenor Gardens, London, S.W.1. (Sloane 6120).

Area Offices:

London and Counties C.D.A.: Terminal House, 52 Grosvenor Gardens, London, S.W.1. (Sloane 6129).

Midland Counties C.D.A.: Land Gear House, 2181 Coventry Road, Sheldon, Birmingham, 26. (Birmingham, Sheldon 5327).

Northern C.D.A.: 54/55 Bondgate, Darlington, Co. Durham. (Darlington 2832).

North Eastern C.D.A.: West Bar Chambers, 38 Boar Lane, Leeds, 1. (Leeds 33361).

Wales C.D.A.: 4 Dock Chambers, Bute Street, Cardiff. (Cardiff 29649).

Lancashire and District C.D.A.: Whitworth House, 115 Princess Street, Manchester, 1. (Manchester Central 3437).

Coke Oven Managers' Association, 1 Cliff Street, Mexborough, Yorks.

Coke Research Association, British, Chesterfield, Derbys. (Chesterfield 76821).

Coking Industry Association, British, 74 Grosvenor Street, London, W.1. (Mayfair 9736).

Combustion Engineering Association, 70 Jermyn Street, London, S.W.1. (Whitehall 5536).

Confederation of British Industry, 21 Tothill Street, London, S.W.1. (Whitehall 6711).

Corrosion Engineers, British Association of, P.O. Box 25, Trafalgar Square, London, W.C.2.

Council for the Protection of Rural Wales, (Cymdeithas Diogelu Harddwch Cymru), Meifod, Montgomeryshire. (Meifod 383).

County Boroughs' Association, Guildhall, Kinston-upon-Hull. (Kinsgton-upon-Hull 36880).

County Councils Association, Eaton House, 66A Eaton Square, London, S.W.1. (Belgravia 5173).

County Councils in Scotland, Association of, 3 Forres Street, Edinburgh. (Caledonian 1626/7).

Derbyshire Clean Air Joint Consultative Committee, Town Clerk's Office, Town Hall, Chesterfield. (Chesterfield 77232).

Domestic Heating Society, Norwich House, 58/62 High Street, Epsom, Surrey.

Domestic Solid Fuel Appliances Approval Council, 4-5 Grosvenor Place, London, S.W.1. (Belgravia 4321).

Electrical Association for Women, 25 Foubert's Place, London, W.1. (Gerrard 5212).

Electrical Engineers, Institution of, Savoy Place, London, W.C.2. (Covent Garden 1871).

Electrical Research Association: Offices, Library and Laboratories, Cleeve Road, Leatherhead, Surrey. (Leatherhead 4151).

Electricity Council, 30 Millbank, London, S.W.1. (Victoria 2333).

EDA Division, Trafalgar Buildings, 1 Charing Cross, London, S.W.1. (Whitehall 6757).

Forest Products Research Laboratory, Princes Risborough, Aylesbury, Bucks. (Princes Risborough 101–2).

Fuel, Institute of, 18 Devonshire Street, London, W.1. (Langham 7124).

Fuel Technology, The College of, 90 Talbot Road, Highgate, London, N.6. (Mountview 6972).

Gas Council, The, Hyde Park House, 4-5 Grosvenor Place, London, S.W.1. (Belgravia 4321).

Gas Engineers, Institution of, 17 Grosvenor Crescent, London, S.W.1. (Belgravia 8266).

Gas Industries, Society of British, 16 Grosvenor Crescent, London, S.W.1. (Belgravia 5632).

Great Britain, Royal Institution of, 21 Albemarle Street, London, W.1. (Hyde Park 5716).

Health Education, Central Council for, Tavistock House, Tavistock Square, London, W.C.1. (Euston 3341).

Health, Ministry of, Alexander Fleming House, Newington Causeway, London, S.E.1. (Hop 5522).

Health, Royal Society of, 90 Buckingham Palace Road, London, S.W.1. (Sloane 5134).

Heating and Ventilating Engineers, Institution of, 49 Cadogan Square, London, S.W.1. (Belgravia 7671/2/3).

Hospital Engineers, Institution of, 15 Cleveland Square, Bayswater, London, W.2. (01-262 7442)

Housing and Local Government, Ministry of, Whitehall, London, S.W.1. (Whitehall 4300). (*See also Alkali Inspectorate*).

Housing Centre Trust, 13 Suffolk Street, London, S.W.1. (Whitehall 2881).

Institute of Housing Managers, Victoria House, Southampton Row, London, W.C.1.

Iron and Steel Federation, British, Steel House, Tothill Street, London, S.W.1. (Whitehall 1030).

Iron and Steel Research Association, British, 24 Buckingham Gate, London, S.W.1. (Tate Gallery 7931).

London and Home Counties Clean Air Advisory Council, Health Department, City Hall, Victoria Street, London, S.W.1. (Tate Gallery 8070).

London Boroughs Association, Westminster City Hall, Victoria Street, London, S.W.1. (Tate Gallery 8070).

Low Temperature Coal Distillers' Association of Great Britain Ltd., P.O. Box No. 21, Chesterfield, Derbyshire. (Bolsover 2281/6).

Manchester and District Regional Clean Air Council, Town Hall, Manchester, 2. (Manchester Central 3377, Ext. 341).

Mechanical Engineers, Institution of, 1 Birdcage Walk, London, S.W.1. (Whitehall 7476).

Medical Officers of Health, The Society of, Tavistock House South, Tavistock Square, London, W.C.1. (Euston 3923).

Medical Research Council, Air Pollution Research Unit, St. Bartholomew's Hospital Medical College, Charterhouse Square, London, E.C.1. (Clerkenwell 1537).

Meteorological Office, London Road, Bracknell, Berkshire.

Meteorological Office, Weather Centres:
Forecasts, London: Temple Bar 4311.
Glasgow: City 3451.
Manchester: Deansgate 6701.
Southampton: Southampton 28844.

Meteorological Society, Royal, 49 Cromwell Road, London, S.W.7. (Kensington 0730).

Midlands Joint Advisory Clean Air Council, The Limes, Dudley Road, Sedgley, Staffs.

Municipal Corporations, Association of, 36 Old Queen Street, Westminster, London, S.W.1. (Whitehall 9861).

Municipal Engineers, Institution of, 25 Eccleston Square, London, S.W.1. (Victoria 5082/3).

National Housing and Town Planning Council Incorporated, 42 Devonshire Street, London, W.1. (Langham 6177).

National Industrial Fuel Efficiency Service, 71 Grosvenor Street, London, W.1. (Hyde Park 9706).

Area Offices:

North Eastern: St. Paul's House, 20/22 St. Paul's Street, Leeds, 1. (Leeds 20046).
44A Great North Road, Newcastle upon Tyne, 2. (Newcastle 813776).

London and South Eastern: 24 Bruton Place, London, W.1. (Hyde Park 7687).
8 Queen Anne Terrace, Gonville Place, Cambridge. (Cambridge 56271).

Wales and South Western: Baltic House, Mountstuart Square, Cardiff. (Cardiff 33825).
9 Great George Street, Bristol, 1. (Bristol 21301).

West Midlands: 6 Harborne Road, Edgbaston, Birmingham, 15. (Edgbaston 4471).

East Midlands: Wellington House, 190 Derby Road, Nottingham. (Nottingham 44753).

North Western: 89 Oxford Street, Manchester, 1. (Manchester Central 9228).

Scotland: 6 Park Terrace, Glasgow, C.3. (Douglas 2453).
49 Meadowside, Dundee. (Dundee 22179).

Northern Ireland: 412 Antrim Road, Belfast 15. (Belfast 76246).

National Trust for Places of Historic Interest or Natural Beauty, 42 Queen Anne's Gate. London, S.W.1. (Whitehall 0211).

Oil Burner Manufacturers' Association, British, 69 Cannon Street, London, E.C.4. (City 4444).

Parliamentary and Scientific Committee, 7 Buckingham Gate, London, S.W.1. (Victoria 2608).

Petroleum, Institute of, Atmospheric Pollution Committee, 61 New Cavendish Street, London, W.1. (Langham 3583).

Power, Ministry of, Thames House South, Millbank, London, S.W.1. (Abbey 7000).

Preservation of Rural England, Council for the, 4 Hobart Place, London, S.W.1. (Belgravia 4771).

Protection of Ancient Buildings, Society for the, 55 Great Ormond Street, London, W.C.1. (Holborn 2646).

Public Health and Hygiene, Royal Institute of, 28 Portland Place, London, W.1. (Langham 2731/2).

Public Health Engineers, Institution of, 32 Eccleston Square, London, S.W.1. (Victoria 3017).

Public Health Inspectors, Association of, 19 Grosvenor Place, London S.W.1. (Belgravia 5158/9).

Road Transport Engineers, The Institute of, 1 Cromwell Place, Kensington, London, S.W.7. (Kensington 3744).

Royal Institution of Great Britain, 21 Albemarle Street, London, W.1. (Hyde Park 0669 and 5716).

Rural District Councils Association, 147 Victoria Street, Westminster, London, S.W.1. (Victoria 6176/7).

Sanitary Association of Scotland, Royal, 150 St. Vincent Street, Glasgow. (Glasgow Central 6606).

Scottish Counties of Cities Association, City Chambers, Edinburgh. (Caledonian 2424).

Scottish Development Department, 43 Jeffrey Street, Edinburgh, 1. (Waverley 8433).

Sheffield and District Clean Air Committee, Town Hall Sheffield. (Sheffield 27241).

Shell-Mex and B.P. Ltd. Shell-Mex House, Strand, London, W.C.2. (01-836 1234).

Social Service, National Council of, 26 Bedford Square, London, W.C.1. (01-636 4066).

Solid Smokeless Fuels Federation, 74 Grosvenor Street, London, W.1. (Mayfair 3327).

Standing Conference of Co-operative Bodies, Warren Spring Laboratory, Gunnels Wood Road, Stevenage, Herts. (Stevenage 3388).

Stationery Office, Her Majesty's, Atlantic House. Holborn Viaduct, London, E.C.1. (City 9876).

Structural Insulation Association, 32 Queen Anne Street, London, W.1. (Langham 7616).

Technology, Ministry of, Millbank Tower, Millbank, London, S.W.1. (Victoria 2255). See also Building Research Station, Forest Products Research Laboratory and Warren Spring Laboratory.

Tees-side Clean Air Committee, Town Clerk's Office, Municipal Buildings, Middlesbrough. (Middlesbrough 45984).

Town and Country Planning Association, 28 King Street, Covent Garden, London, W.C.2. (Temple Bar 5006).

Town Planning Institute, 26 Portland Place, London, W.1. (Museum 9107/8/9).

Urban District Councils' Association, Palace Chambers, Bridge Street, London, S.W.1. (Whitehall 4868).

Warren Spring Laboratory, (Ministry of Technology), Gunnels Wood Road, Stevenage, Herts., (Stevenage 3388).

Warwickshire Clean Air Council, Council Offices, Bedworth. (Bedworth 3061).

West Bromwich Clean Air Council, West Bromwich Corporation, P.O. Box No. 40, Town Hall, Lombard Street West, West Bromwich.

West Lancashire and Cheshire Regional Smoke Abatement Committee, c/o Health Department, Hatton Garden, Liverpool, 3. (Liverpool Central 8433. Ext. 180).

West Riding Clean Air Advisory Council, Public Health Department, 25 East Parade, Leeds, 1. (Leeds 30661).

Women of Great Britain, National Council of, 36 Lower Sloane Street, London, S.W.1. (Sloane 0619).

Women's Advisory Council on Solid Fuel, The, 18 South Molton Street, London, W.1. (Mayfair 5358).

Women's Gas Federation, 5 Grosvenor Crescent, London, S.W.1. (Belgravia 4321).

Overseas

Argentine

Asociación Argentina Contra la Contaminación del Aire, Sarimento 680, Buenos Aires.

Australia

Dept. of Public Health, N.S.W. Air Pollution Control Branch, 86-88 George Street, Sydney, N.S.W.

Austria

Austrian Society of Industrial Medicine, Kinderspitalgasse 15, Vienna, 9.

Belgium

Centre Scientifique et Technique de la Construction 5 rue de la Violette, Brussels, 1.

Conseil National Contre la Pollution de l'Air, 6, Place de Martyrs, Brussels.

Society of Health and Social Medicine. Secretary: Professor Graffar, Professor of Social Medicine, Liberal University of Brussels.

Cebedair, 2, rue Armand Stévart, Liége.

Brazil

Associação Brasileira de Prevenção à Poluição do Ar.
Rua Catumb, 318-6° ander, São Paulo, 2.P.7.

Canada

Department of National Health and Welfare. Environmental Assessment Unit Occupational Health Division, 455 Spencer Street, Ottawa 4, Ontario.

Czechoslovakia

Czech Polytechnic University of Prague, Faculty of Mechanical Engineering, Department of Air Engineering, Praha 6, Technická 1902.

Czechoslovak Academy of Sciences, Institut for Physics of the Atmosphere, Praha 4, Spořilov, Boční 11.

Czechoslovak Institut of Physical Chemistry, Department of Physical Chemistry of Aerosols, Praha 2, Máchova 7.

Institut of Hygiene, Praha 10, Srobarova 48.
Power Research Institut, Praha 7, Partizánská 7a.
Research Institut of Air Engineering, Praha 10, Malešice.

Denmark

Cinderkoks Information, Raadhuspladsen 59, Copenhagen 5.

Densk Kedelforening, Vesterbrogade I.A., Copenhagen.

France

Association pour la Prévention de la Pollution Atmosphérique. M. Yvan Queret, 62 rue de Courcelles, Paris 8.

Association Technique de l'Industrie du Gaz en France, 62, rue de Courcelles, Paris, 8.

Centre d'Information pour le Développement de Conditionnement d'Air, de la Ventilation, du Filtrage de l'Air et du Dépoussierage, 38 rue Copernic, Paris 16.

Charbonnages de France, 9 Avenue Percier, Paris 8.

Institut National d'Hygiène, 11 bis rue de Milan, Paris 9.

Institut Français des Combustibles et de l'Energie, 3 rue Henri Heine, Paris 16.

Institut National de Recherche Chimique Appliquée, 12 Quai Henri IV, Paris 4.

Societé Française des Pétroles BP, 21 rue de a Bienfaisance, Paris 8.

Union Européenne de Medicine Sociale, 1 rue de Courcelles, Paris 9.

Finland

Ministry for Internal Affairs, Aleksanterinkatn 3D, Helsinki.

Germany

Agrikulturchemisches Institut, Heiligenhaus Bez, Am Vogelsang 14, Düsseldorf.

Bundesministerium für Gesundheitswesen, Michaelstr 10, Bad Godesberg.

Deutsche Gesellschaft für Mineralölwissenschaft und Kohlechemie e.V. Mittelweg 180, Hamburg 13.

Deutscher Stadtetag, Lindenallee 11, Köln-Marienburg.

Deutscher Verein von Gas-und Wasserfachmännern Beethovenstr. 17, Frankfurt (Main).

Gaswärme-Institut Essen e.V. Holbeckshof, Essen-Steele 43.

Hygienisches Institut, Gorch-Fock-Wall 15/17, Hamburg 36.
Institut für Gewerbliche Wasserwirtschaft und Luftreinhaltung e.V. Habsburgerring 2/12, Köln 5.
Institut für Grubensicherheit und Arbeitsschutz, Kirchgasse 11, Freiberg/Sa.
Institut für Technische Physik der Frauenhofer-Gesellschaft, Königstr 70/74, Stuttgart-Degerloch. Dr.-Ing. Reiher, Director.
Institut für Wasser, Boden und Lufthygiene Corrensplatz 1, Berlin 33.
Landesinstitut für Arbeitsschutz und Arbeitsmedizin, Kaiserallee 61, 75 Karlsruhe.
Landesanstalt für Bodennutzungsschutz des Landes Nordrhein-Westfalen, Marienplatz 4, Bochum.
Ruhrkohlen-Beratung GmbH, Frau-Bertha-Krupp-Str. 4, Essen.
Staubforschungsinstitut des Hauptverbandes der Gewerblichen Berufsgenossenschaften e.V.
Langwartweg 103, Bonn. Prof. Winkel, Director.
Steinkohlenbergbauverein, Friedrichstr 2, Essen 1. Prof. Weissner.
Technischer Überwachungs-Verein Essen e.V. Steubenstr. 53, Essen 1.
Verein Deutscher Eisenhüttenleute, Breite Strasse 27, Düsseldorf.
Verein Deutscher Ingenieure (Kommission Reinhaltung der Luft), Prinz Georg Strasse 77/79, Düsseldorf. Secretary: M. Kraemer.
Vereinigung der Grosskesselbesitzer e.V. Kurfürstenstr. 27, Essen 1.

India

All Indian Institute of Hygiene and Public Health. Industrial Health Research Unit, Section of Physiological and Industrial Hygiene, Calcutta.
Central Public Health Engineering Research Institute, 70-71 Civil Lines, Nagpur.

Italy

Consiglio Nazionale delle Ricerche Pizzale delle Scienza 7, Rome.
ILVA Society, Via Corsica 4, Genoa.
Institute of Hygiene, University of Ferrara, Corso Giovecca 173A, Ferrara.
Institute of Hygiene, University of Genoa, Via A. Pastore 1, Genoa.
Instituto di Ingegneria Sanitaria del Politecnico di Milano, Piazza Leonardo da Vinci 32, Milan.
Stazione Sperimentale per i Combustibili, Via G. Pascali 55, Milan.
Istituto Superiore di Sanita, Viale Regina Elena 299, Rome.
Stazione Sperimentale dei Combustibili, Piazza Leonardo da Vinci 32, Milan.
NANS (Union of Nations for Fight against Noise and Smog) via Garibaldi 25, Turin.

Japan

Institute of Public Health, Shirokanedaimachi Shiba, Minato-ku, Tokyo.
Kanto-Shin-Etsu Heat Control Society, 54 Takata-Oimatsu-cho, Bunkyo-ku, Tokyo.

Malta

National Society for Clean Air of Malta, 8-10 Civic Centre, Senglea.

Netherlands

Atmospheric Pollution Division; 14 Duinweg, The Hague.
Central Organization/Applied Scientific Research T.N.O., Committee for Industrial Air Pollution, 12, Koningskade, The Hague.
Commission for Soil, Water, and Air, Baan 170, Rotterdam.
Council for Air Pollution, Zeestraat 73, The Hague.
Netherlands Association for Water, Soil and Air Pollution. Nienwe Achtergracht 100, Amsterdam.

Research Institute for Public Health Engineering T.N.O., (Organization for Health Research T.N.O.) Industrial Air Pollution Division, 97, Schoemakerstraat Delft.
Stichting Concawe (For conservation of clean air and water from oil refinery activities in Western Europe). 700 van Alkemaadelaan, The Hague. Secretary: Mr. G. P. Liedmeier.

Norway

Institute of Hygiene, University of Oslo, Blindern, Oslo.
Røykskaderådet, c/o Ministry of Industry, Oslo.

Poland

State Institute of Hygiene, 24 Chocimska Street, Warsaw.

South Africa

National Physical Laboratory of the Council for Scientific and Industrial Research, Box 395, Pretoria, Transvaal.

Spain

Municipal Institute of Hygiene, Place de Lesseps 1. Barcelona.

Sweden

AB Svenska Fläktfabriken, Kungsgatan 18, Stockholm.
Swedish National Committee for Air Purification, Sveavärgen 166 XI, Stockholm.

U.S.A.

Air Pollution Control Association, 4400 Fifth Avenue, Pittsburgh, 13 Pa.
Air Pollution Foundation, 2556 Mission Street, San Marino, California.
Bay Area Air Pollution Control District, 1480 Mission Street, San Francisco 3, California.
Bituminous Coal Research Inc., 35 Hochberg Road, Monroe, Pittsburgh 13, PA.
California State Motor Vehicle Pollution Control Board, 217 W. First Street, Los Angeles 12, California.
Los Angeles County Air Pollution Control District, 434 S. San Pedro Street, Los Angeles 13, California.
New York Dept. of Air Pollution Control, 15 Park Row, New York 38 N.Y.
Robert A. Taft Sanitary Engineering Centre, 4676 Columbia Pky., Cincinatti 26, Ohio.
U.S. Dept. of Health, Education and Welfare, Public Health Service, Division of Air Pollution, DHEW Building South, Washington 25, D.C.

U.S.S.R.

Institute of Communal Hygiene, Pogodinskaja 10, Moscow.
Medical Control Committee on Air Pollution, State Medical Commission, Moscow.
State Committee on Chemistry, Moscow.

World Health Organization

Division of Environmental Sanitation, Palais des Nations, Geneva, Switzerland.
Regional Health Officer, Office for Europe, 8 Scherfigsvej, Copenhagen, Denmark.

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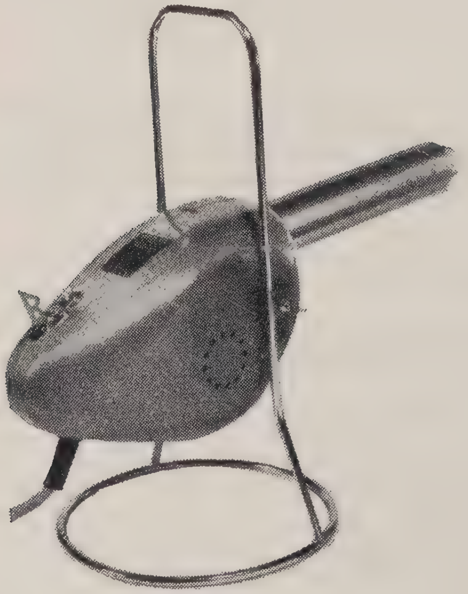

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Northern Ireland: W. E. C. O'Brien (co-opted).

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Northern Ireland: R. Campbell Brown, *Chairman:* W. E. C. O'Brien. *Hon. Secretary:* Down County Health Dept., 414 Ormeau Road, Belfast, 7. Belfast 642905.

North West: A. Taylor, *Chairman;* W. E. Pollitt, *Hon. Secretary*, Health Department, Ryecroft Hall, Audenshaw, Lancs. Droylsden 1355.

North East: Alderman B. N. Young, *Chairman:* L. Mair, *Hon. Secretary:* Health and Social Services Department, Civic Centre, Barras Bridge, Newcastle-upon-Tyne, 1. Newcastle 28520.

Yorkshire: A. C. Saword, *Chairman;* James Goodfellow, *Hon. Secretary*, Public Health Dept., 12 Market Buildings, Vicar Lane, Leeds, 1. Leeds 30211, Ext. 29.

West Midlands: Councillor F. V. Magness, *Chairman:* W. L. Kay, *Hon. Secretary*, Public Health Inspector's Office, Municipal Buildings, Old Hill, Staffs. Cradley Heath 66891.

East Midlands: Councillor Mrs. D. M. Ashley, *Chairman;* A. Wade, M.B.E., *Hon. Secretary*, "Sandygate," Bramcote Lane, Wollaton, Nottingham. Nottingham 284873.

South East: W. Combey, *Chairman:* J. S. Hodgins, *Hon. Secretary*, Public Health Department, Drayton Hall, West Drayton, Middlesex. West Drayton 2275.

South West: G. J. Creech, M.B.E., *Hon. Secretary*, St. Clement's House, Marsh Street, Bristol, 1. Bristol 26241.

South Wales and Monmouthshire: Alderman Dr. C. A. Bence, *Chairman:* L. Morgan, *Hon. Secretary*, 9 Lodge Drive, Port Talbot, Glamorgan.

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Northern Ireland Division

Antrim C.C., Ballymena, Belfast, Carrickfergus, Castlereagh, Londonderry.

North West Division

Abram, Accrington, Altrincham, Ashton-in-Makerfield, Ashton-under-Lyne, Atherton, Audenshaw, Bacup, Barrow-in-Furness, Bebington, *Birkenhead*, Blackburn, Blackpool, Bolton, *Bootle*, Bredbury & Romiley, Brierfield, Burnley, Bury, Buxton, Chadderton, Cheadle & Gatley, Cheshire C.C., Chester, Chorley, Church, *Clitheroe*, Colne, Connah's Quay, Crewe, Crompton, *Crosby*, *Cumberland C.C.*, Darwen, Denton, Droylsden, Dukinfield, Eccles, Ellesmere Port, Failsworth, Farnworth, Fleetwood, Flint, Fulwood, Glossop, Golborne, Great Harwood, Hale, Haslingden, Haydock, Hazel Grove & Bramhall, Heywood, Hindley, Horwich, *Hoylake*, Huyton-with-Roby, Hyde, Ince-in-Makerfield, Irlam, Kearsley, Kirkby, Lancashire C.C., Lancaster, Lees, Leigh, Leyland, Littleborough, Liverpool, Longdendale, Macclesfield, Manchester, Marple, Matlock, Middleton, Middlewich, Mold, Morecambe & Heysham, Nantwich, Nelson, Newton-le-Willows, Northwich R.D.C., Northwich U.D.C., Oldham, Ormskirk, Padiham, Preston, Preston R.D.C., Prestwich, Radcliffe, Ramsbottom, Rawtenstall, Rhyl, *Rishton*, Rochdale, Royton, Runcorn R.D.C., Runcorn U.D.C., St. Helens, Sale, Salford, Skelmersdale, *Southport*, Stalybridge, Standish-with-Langtree, Stockport, Stretford, Swinton & Pendlebury, *Thornton Cleveleys*, *Tintwistle*, Tyldesley, Up Holland, Urmston, Wallasey, Warrington, *Warrington R.D.C.*, *West Lancashire*, Whiston, Whitefield, Whitworth, Widnes, Wigan, Wilmslow, Winsford, Workington, Worsley, Wrexham, Wrexham R.D.C.

North East Division

Ashington, Barnard Castle, Bedlingtonshire, Billingham, Bishop Auckland, Blaydon, Brandon & Byshottles, Castle Ward, Chester-le-Street R.D.C., Chester-le-Street U.D.C., Consett, Crook & Willington, *Darlington*, Durham, Eston, Felling, Gateshead, Gosforth, Hartlepool, Hebburn, Hetton, Houghton-le-Spring, Jarrow, Lanchester, Longbenton, Middlesbrough, Newburn, Newcastle-upon-Tyne, Northumberland C.C., Prudhoe, Redcar, Ryton, Saltburn & Marske-by-the-Sea, Seaham, Sedgefield, Shildon, Skelton & Brotton, South Shields, Spennymoor, Stanley, *Stockton-on-Tees*, Sunderland, Sunderland R.D.C., Thornaby-on-Tees, Tynemouth, Wallsend, Washington, West Hartlepool, Whickham, Whitley Bay.

Yorkshire Division

Adwick-le-Street, Aireborough, Batley, Bentley-with-Arksey, Bingley, Bradford, Bridlington, Brighouse, Castleford, Colne Valley, Conisbrough, Cudworth, Darton, Dearne, Denby Dale, Dewsbury, Doncaster, Doncaster R.D.C., Elland, Halifax, Harrogate, Heckmondwike, Hemsworth R.D.C., Hemsworth U.D.C., Hepton, Holmfirth, Horbury, Horsforth, Hoyland Nether, Huddersfield, Ilkley, *Keighley*, Kingston-upon-Hull, Knottingley, Leeds, Meltham, Mesborough, Mirfield, Morley, Normanton, North Riding C.C., Ossett, Otley, Pontefract, Pudsey, Queensbury & Shelf, Rawmarsh, Rotherham, Rothwell, Royston, *Scarborough*, Sheffield & District Clean Air Committee, Shipley, Skipton, Sowerby Bridge, Spenborough, Stanley, Swinton, Todmorden, Wakefield, Wakefield R.D.C., Wath-upon-Dearne, Wombwell, Worsbrough, Wortley, *York.*

West Midlands Division

Bedworth, Birmingham, Brownhills-Aldridge, Burton-on-Trent, Cannock R.D.C., Cannock U.D.C., Coventry, Dudley, Halesowen, Hereford, Kidderminster, Leamington Spa, Lichfield, Meriden, Newcastle-under-Lyme, Nuneaton, Redditch, Rugby, Rugeley, *Seisdon*, Solihull, Stafford, Staffordshire C.C., Stoke-on-Trent, Stone, Sutton Coldfield, Walsall, Warwick, Warwick R.D.C., *Warwickshire C.C.*, *Wellington*, West Bromwich, Wolverhampton, Worcester.

East Midlands Division

Alfreton, Basford, Beeston & Stapleford, Belper, Bingham, Blaby, Blackwell, Bolsover, Boston, *Cambridge*, Carlton, Chesterfield, Chesterfield R.D.C., Clay Cross, Clowne, Coalville, Corby, Derby, Dronfield, Eastwood, Gainsborough, Glanford Brigg, Grantham, Great Yarmouth, Grimsby, Heanor, Hinckley, Ilkeston, Ipswich, Irthlingborough, Kettering, King's Lynn, Kirkby-in-Ashfield, Leicester, Lincoln, Long Eaton, Loughborough, Lowestoft, Mansfield, Mansfield Woodhouse, Newark, Norwich, Nottingham, *Nottinghamshire C.C.*, Old Fletton, Peterborough, *Repton*, Ripley, Rushden, Scunthorpe, Southwell, Staveley, Sutton-in-Ashfield, Swadlincote, *Wellingborough*, West Bridgford, Wisbech, Worksop, Worksop R.D.C.

South West Division

Bath, *Bathavon*, *Bridgwater*, Bristol, Cheltenham, Dursley, Gloucester, *Keynsham*, Kingswood, Lydney, *Mangotsfield*, *Norton-Radstock*, *Poole*, *Shepton Mallet*, *Sherborne*, *Sodbury*, Stroud, *Tetbury*, *Tewkesbury*, Thornbury, *Weston-super-Mare*, West Penwith, Weymouth & Melcombe Regis.

South East Division

Amersham, Aylesbury, Barking, Barnet, Basildon, Bedford, Bedfordshire C.C., Bexley, Bishop's Stortford, *Bognor Regis*, *Bournemouth*, Braintree, Brent, Brighton, Bromley, Bullingdon, Bushey, Camden, Chatham, Chesham, Cheshunt, Chigwell, *Clacton*, Crawley, *Croydon*, Dartford, Dartford R.D.C., Dover, Ealing, Eastbourne, Eastleigh, Egham, Elstree, Enfield, Epping & Ongar, Epsom & Ewell, Esher, *Essex C.C.*, Eton, *Farnborough*, Folkestone, Gillingham, *Gosport*, Gravesend, Greater London Council, Greenwich, Guildford, Guildford R.D.C., Hackney, Hammersmith, Harlow, Harrow, Hastings, Havant & Waterloo, Havering, Hemel Hempstead, High Wycombe, Hillingdon, Hitchin, Hoddesdon, Horsham, Hounslow, Hove, *Kensington & Chelsea*, *Kent C.C.*, Kingston-upon-Thames, Lambeth, *Leatherhead*, Lewisham, *Littlehampton*, London, City of, *Luton*, Maidenhead, Merton, New Forest, *Newham*, Northfleet, Oxford, *Portsmouth*, *Reading*, Redbridge, *Reigate*, Richmond-upon-Thames, Rickmansworth, Rochester, Sittingbourne & Milton, Slough, *Southampton*, *Southend-on-Sea*, Southwark, Southwick, Staines, Strood, Sutton, Thurrock, Tower Hamlets, *Tunbridge Wells*, Watford, Watford R.D.C., Westminster, Windsor, Windsor R.D.C., *Worthing*, Wycombe.

South Wales & Monmouthshire Division

Abercarn, Aberdare, Abertillery, Barry, Bedwas & Machen, Bedwellty, Bridgend, Caerleon, Caerphilly, Cardiff, Cardiff R.D.C., Cwmbran, Ebbw Vale, Gellygaer, Glamorgan C.C., Llanelly, Llanelly R.D.C., Llantrisant & Llantwit Fardre, Magor & St. Mellons, Merthyr Tydfil, Monmouthshire C.C., Mountain Ash, Mynyddislwyn, Neath, Newport, Penarth, Pontypool, Pontypridd, Port Talbot, Rhondda, Swansea, Tredegar, Ystradgynlais.

Overseas

Durban (South Africa), Geleen (Netherlands), Johannesburg (South Africa), Leichhardt (Australia), *Newcastle* (Australia), *Vereeniging* (South Africa).

35th ANNUAL REPORT

for 1965

A GREAT deal of useful work towards the promotion of its objectives was done by the Society during the year, but with any satisfaction that may be felt there is always a sense of regret that if resources were greater much more would have been achieved. Major or spectacular advances can no longer, from the nature of the case, be expected, and further progress towards clean air must be regarded as a process of steady, continuing erosion of the outstanding problems. The Society could do much to speed up this process if it had the means, but nevertheless it is believed that the record will show a healthy maintenance of initiative and persistence. One difficulty in preparing these reports is that it is impossible to detail the innumerable minor activities and services that together may do as much to promote clean air as any main event.

The Annual Meeting

The annual general meeting was held in London on 4 May. It marked the end of the successful Presidential term of Dr. Albert Parker, C.B.E., and the election as his successor of Sir Alan Wilson, F.R.S. The meeting was followed by the annual luncheon, at which the principal guest was the Rt. Hon. Fred Lee, M.P., Minister of Power. Mr. Lee's encouraging address at the luncheon was fully reported in *Smokeless Air* (134, Spring, 1965).

The Annual Conference

The 32nd annual conference of the Society was held at Eastbourne from 26 to 29 October, and with it was again held the Clean Air Exhibition. The conference attendance was a little lower than recent conferences held in the north, but there were over 900 delegates and members. The conference was opened by Mr. John Morris, M.P., Parliamentary Secretary, Ministry of Power, who came at very short notice in place of Mr. Robert Mellish, M.P., Joint Parliamentary Secretary, Ministry of Housing and Local Government, who was prevented from coming because of Parliamentary duties. Mr. Morris's address was followed by Sir Alan Wilson's Presidential Address. Both addresses have been published in full in *Smokeless Air* (136, Winter, 1965).

A full and very successful programme was arranged, the subjects covering a wide field. On the domestic side there were papers on successes with smoke control areas, on the distribution problems of solid smokeless fuel, and on "new horizons" in the use of solid fuel, gas, electricity and oil. On the industrial side were papers on odour control by catalytic combustion, the selection of industrial dust collection equipment, chimney heights, and on unresolved problems in industrial pollution. There were also papers on road vehicle pollution control in Belgium and on a recent survey on air pollution and mortality from bronchitis and lung cancer.

Visits were made to a cement works, a paper mill, an oil refinery and the new nuclear power station at Dungeness. The Mayor of Eastbourne, Councillor Mrs. K. J. Underhay, was a charming hostess in welcoming the conference at its opening session and at the civic concert for delegates on the Thursday evening.

The friendly assistance and co-operation of all the Eastbourne officers concerned with the arrangements was greatly appreciated. This included invaluable help in the promotion and judging of a clean air poster competition for schoolchildren in the area, for which prizes were offered by a number of the Society's commercial members and friends.

The Exhibition, though a little smaller than in other recent years, was again a most attractive show and was regarded as most successful.

Exhibition at Düsseldorf

The Society broke interesting new ground by participating in the International Clean Air Conference and Exhibition organized in April at Düsseldorf by the VDI-Kommission Reinhaltung der Luft and the Novea exhibition organization. A British Joint Venture Stand was undertaken by the Board of Trade and the Society on behalf of a number of co-operating firms and the Ministry of Technology (Warren Spring). One section of the stand was occupied by the Society on its own behalf as the centre for information. This British enterprise attracted much attention from the large number of visitors and delegates to the conference, and can be regarded as highly successful. It did much to promote the interests of members and friends of the Society who exhibited their products; and in promoting knowledge of the clean air movement in Britain added to the prestige of the Society.

One of the few overseas papers at the conference held at the same time was on "Education and Publicity for Clean Air", by the Director of the Society. It was published in German in the technical journal *Staub*, and subsequently in an English version in *Smokeless Air*.

The Divisions

As reference to their own reports will show, the Society's Divisions (with one exception) have been most active during the year. We are particularly pleased to report the establishment of a Divisional Council in the South West Division. This completes the full coverage of the United Kingdom by Divisional Councils.

Publicity and Education

A pictorial wall-chart for use in schools was published for the Society by Educational Productions Ltd., which is also undertaking its promotion and distribution to schools throughout the country. For use with the chart the Society prepared and published a booklet of lecture notes on clean air. This was designed also to be useful to speakers and lecturers on the subject quite independently of the wall-chart.

New exhibition material, including two transportable display units, was prepared and there has been a steady demand for the loan of these and other material. The popular leaflets issued by the Society have also continued to be called for in quantity.

Publicity for clean air and for the Society itself, through the Press and on radio and television, has been, as always, actively sought by the Society from its headquarters. 25 press releases were issued during the year, relating to meetings, the conference, and our publications. Over 800 press cuttings were received mentioning the Society by name. In addition, there were 6,500 cuttings from all kinds of publications, including many from other countries, concerning air pollution. Much useful publicity was obtained through articles, news items, and comments published in *Smokeless Air*. Letters to editors, replying to criticisms on clean air policy, have continued to be written and published. It is not always easy however for time to be found by the small staff available to deal with newspaper controversies, where prompt action is essential.

Articles for various publications, and a number of lectures and talks, have also been undertaken by members of the staff. At least five radio or television programmes dealt with clean air, among which a Granada feature on bronchitis was the most notable, and for which the Society provided a great deal of information.

Extensive use has been made, by members and others, of the Society's library, its information services, and its library of photographs. The time involved is often without direct benefit to the Society, but in other ways these services directly contribute to the Society's primary objectives of promoting knowledge of the importance of clean air.

International

The growth of concern about air pollution has continued to grow in many parts of the world, and the Society has maintained its active interest in international affairs. The International Union of Air Pollution Prevention Associations became fully established by the acceptance of its draft constitution by all the six founder members, and an Executive Committee was set up. This body agreed that the first of the four-yearly international congresses should be held in London in 1966, and as a consequence the first President of the Union is the Society's President, and the first Secretary the Society's Director. The Congress is being organized for the Union by the Society, and the considerable amount of work involved was well under way before the end of the year.

In addition to the participation in the Düsseldorf conference and exhibition, the Director attended, as a guest, an international congress in Buenos Aires in November. Meetings of the International Union were held during this event.

The Society's headquarters were visited during the year by a number of overseas visitors, including the members of a committee from Sweden, and others from Japan, Poland, Czechoslovakia, and the United States.

Membership and Finance

Membership of the Society, and income from subscriptions, has remained steady, despite slight losses due to the amalgamation of London local authority members and the resignation of some corporate members. Nevertheless the accounts for the year again show a surplus, as in previous recent years. To enable the Society to continue to make its influence felt and expand its activities, it is hoped that members will continue to give it every possible support.

Field House,
Breams Buildings,
London, E.C.4.

JAMES GOODFELLOW, *Chairman.*
STANLEY E. COHEN, *Hon. Treasurer.*
ARNOLD MARSH, *Director and Secretary.*

Scottish Division

The Annual General Meeting and Conference of the Scottish Division was held in Aberdeen from 19 to 21 May 1965. It had been decided to hold the Annual General Meeting, together with a social evening for all delegates, prior to the Conference sessions on 20 and 21 May, and most delegates were agreed that this new arrangement was more satisfactory. Previously, the meeting had been held on the opening day of the Conference and had somewhat curtailed the first morning's session. The Caledonian Hotel was the venue for the Annual General Meeting and social evening on 19 May. The members of the Division learned with regret that Mr. T. M. Ashford, the Lecturer to the classes for firemen and boiler house practice, had submitted his resignation as Lecturer. Many tributes were paid to Mr. Ashford, who had been the Lecturer for thirty-seven years, and the Annual General Meeting agreed to record their appreciation of his long and active association with the Division. Mr. John Christie, Senior Assistant Smoke Inspector, Glasgow, was appointed lecturer in succession to Mr. Ashford.

After the Lord Provost of Aberdeen had welcomed the delegates to the Conference on the morning of 20 May, Mr. James Goodfellow, Chief Sanitary Inspector, Leeds, Chairman of the National Executive Council of the Society, gave an address on "Smoke Control Areas".

At the afternoon session on the first day, Dr. Marjorie Clifton, Warren Spring Laboratory, and Mr. W. L. Baxter, Senior Mechanical Engineer, Ministry of Transport, gave addresses on "Air pollution from motor vehicles".

In the evening, the delegates attended a civic reception given by the Lord Provost and Town Council in the Beach Ballroom and tribute must be paid to Aberdeen for the hospitality received.

On the second day of the Conference short addresses were given by representatives of the various fuel interests on "Domestic fuel supplies and the Clean Air policy". As expected, there was a lively discussion period at this session. The Conference closed with a luncheon for delegates and friends at the Caledonian Hotel and Mr. Arnold Marsh gave his usual racy report on the activities of the Society during the past year.

It is sad to report that Aberdeen is the only large city in Scotland which does not seem to be interested in clean air. The Clean Air Exhibition, which was held during the Conference, was poorly attended, but one consolation was the excellent Press publicity given to the Conference, especially by the local papers. Some delegates had pointed out that Aberdeen, in spite of being a holiday resort, had the same problems as any other city, and the Press were not slow in publicising some of the criticisms. It is hoped that the Conference, in some small way, helped to make the Aberdonians less complacent about the purity of their air.

In addition to the Annual General Meeting, during 1965 the Division met on two occasions and the Executive Committee held four meetings. At the beginning of the year the Division approved a resolution, which was sent to the Secretary of State for Scotland and interested bodies, expressing concern about the cost of solid smokeless fuel in Scotland. It would seem that the representations have had very little effect.

J. W. TRAILL, *Hon. Secretary*

Northern Ireland Division

During 1965 the work of the Society went quietly but steadily forward. The major event of the year was the coming into operation on 1 July of the Clean Air Act 1964 and the making of the subordinate legislation. The Ministry of Health and Social Services have circulated local authorities on their duties and responsibilities under the Clean Air Act and in addition have issued a Memorandum on Smoke Control Areas and another on the Industrial and Miscellaneous Provisions of the Clean Air Act. These Memoranda have been very well prepared and will be most useful to local authorities and their officers in administering the Act.

The way is now clear for local authorities to take steps to control the emission of smoke within their districts. The Divisional Council feel sure that local authorities and their officers will use every endeavour to give effect to their obligations under the Act.

The industrial aspects of the Act which

include such matters as the installation of furnaces and chimney heights are the responsibility of the various County Health Committees and it is good to know that since the 1 July these Committees and their officers are in a position to control the height of new chimneys at industrial premises. The resources of the National Society are available to help and encourage local authorities in every possible way.

The coming year is likely to be a year of increased activity for the Northern Ireland Division. Already a clean air conference for local authorities and other public bodies has been arranged to take place in the Spring in the Town Hall, Portadown. This conference will bring members of local authorities and their officers together at a very vital time and it is hoped that this meeting will do much to stimulate interest in the Clean Air Act and in its own way make a real contribution to the cause of clean air.

W. E. C. O'BRIEN, *Hon. Secretary*

North-West Division

The Annual General Meeting was held in the Town Hall, Leigh on 16 March 1965. The meeting was addressed by Mr. James Goodfellow, Chairman of the National Executive Council of the National Society for Clean Air.

The Divisional Council met on four occasions. The first meeting was held at Messrs. Pilkingtons, St. Helens on the 23 February 1965. At this meeting Mr. Alan Taylor of the National Coal Board was elected Chairman of the Division and Miss N. Kenyon of the Women's Electrical Association was elected Vice Chairman. The second meeting was held at the premises of the National Carbonising Co., Mansfield on 26 May 1965. The third meeting was held at the North Western Gas Board Headquarters, Welman House, Altrincham on 28 July 1965. The fourth meeting was held at the Health Centre, Salford on 8 December 1965. Also during the year there were two full meetings of the Division, one at the premises of Messrs. Coalite Ltd., Chesterfield on the 7 September 1965. The members were entertained to luncheon by the Directors of Messrs. Coalite Ltd., and afterwards an inspection of the carbonizing plant was made. The second meeting of the full division was held at the Trawsfynydd and Ffestiniog Power Stations. Lunch was provided by the Central Electricity Generating Board and members had the opportunity of inspecting the generating plant and Trawsfynydd Dam.

There was a joint meeting of the Divisional Council and the Institute of Fuel which took the form of a hot pot supper. The meeting was held at the Engineers Club, Manchester on the 7 September 1965. This was not attended as well as it might have been owing to very foggy weather.

There were two meetings of the Publicity Sub Committee held during the year. Due to shortage of finances within the Division no real effort at publicity was made, but as a result of this financial shortage the National Executive of the National Society have been told the views of the Divisional Council on this matter and it is hoped in the ensuing year that the ideas of the Publicity Sub Committee will not be restricted by the shortage of finance.

The progress in Smoke Control gathered speed during the year after the delay caused by the "fuel change policy" and surely since the Minister of Power's letter to backward authorities in September 1965 and the guarantee of supply of smokeless fuels by the Smokeless Fuel Producers in December, there is now no reason for any further delay.

Advice to members of the public, replies to Press Representatives and speaking on the overseas service of the BBC has formed part of your Secretary's duties during the year.

W. E. POLLITT, *Hon. Secretary*

North-East Division

As in former years the Division continued to operate within a programme of having only one meeting during the year, and on this occasion it was held in April at Billingham on Tees. The Chairman, in his annual address, referred to the serious loss due to the death of Alderman John Chapman, M.B.E., past Chairman and Vice Chairman of the Divisional Council, and he continued by referring to problems created in the North East due to the lack of availability of suitable fuels to enable local authorities' smoke control programmes to proceed as planned.

The annual elections resulted in the re-election of Alderman B. N. Young of Gateshead as Chairman; Councillor T. Prudham of Felling U.D.C., and Professor P. C. G. Isaac of the University of Newcastle upon Tyne as Vice-Chairmen; Mr. F. Ireland, City Treasurer, Newcastle upon Tyne, as Honorary Auditor and Mr L. Mair of Newcastle upon Tyne as Honorary Secretary and Treasurer.

The outstanding feature of this meeting was the symposium on district heating presented by Mr. A. J. Elder, A.R.I.B.A., Consulting Architect to Billingham U.D.C., and Mr. E. J. Milburn, Deputy Marketing Director of the Northumberland and Durham Division of the National Coal Board. The speakers dealt with the historical development of Billingham and the incorporation of a system of direct heating into the existing pattern of Town Centre development and then outlined in some detail the method of operation of the system, the difficulties which had been encountered and an analysis of the costs, including overheads, arising from this project. At the conclusion of the ensuing discussion Mr. R. V. Robinson, Chief Public Health Inspector of South Shields C.B., proposed a vote of thanks to the speakers for their contributions; to the Billingham U.D.C., and its officers for the excellent arrangements made for members and to the Northumberland and Durham Division of the N.C.B., for the most lavish hospitality which had been afforded to representatives as well as for making arrangements for holding the meeting. This vote of thanks was received with sustained acclamation.

During the year there were many occasions when the Honorary Secretary found it necessary to approach individual members for information and comments as to the atmospheric pollution situation in their area. The opportunity is taken in this report to express thanks to the Chief Public Health Inspectors of those local authorities in the North East who so readily co-operated in supplying information.

L. MAIR, *Hon. Secretary & Treasurer*

Yorkshire Division

During the year the Divisional Council held three meetings in Leeds and one at Thorpe Marsh, Nr. Doncaster.

On the 5 April the Council visited the works of Messrs. John Thompson (Triumph) Ltd., Kirkstall Road, Leeds, to see the latest developments in Chain Grate Stoker design. The second meeting of the year was held at Thorpe Marsh, near Doncaster where the Council made a very instructive visit to this large capacity Power Station. The discussion at this meeting was on "Publicity regarding the relative cost of Solid Smokeless Fuels". The two further meetings held in Leeds dealt with the future programme and suggestions on the "Proposed Revision of the Clean Air Act."

Two new films were shown to Society Members during the year—"It Takes Your Breath Away" and the Gas Council's film "Saharan Venture" both of these will be shown at our Annual General Meeting.

Representatives of the Press have been present at two of our meetings during the year and their support and the resulting publicity has been most helpful.

JAMES GOODFELLOW, *Hon. Secretary*

West Midlands Division

During the year we had two excellent meetings. The first, the occasion of our fifteenth Annual General Meeting, was held at Meriden, when an address was given by Mr. H. Moys, B.Sc.(Eng.), A.M.I.C.E., M.I.Gas E. on "Modern Gasmaking Processes" with particular reference to the Coleshill Works. After lunch, kindly provided by the West Midlands Gas Board, members were conducted round the Lurgi Plant at Coleshill.

The second, in the Autumn, consisted of a visit to the Coalbrookdale Works, Ketley, of Allied Ironfounders Ltd. This afforded members the opportunity not only to see a modern foundry making a variety of approved solid fuel burning appliances, but also to see their wonderful museum, which is quite unique in this country, if not in the world. An interesting account of this visit appeared in the winter edition of "Smokeless Air".

The Divisional Council considered, amongst other things, methods of publicity, technical problems and matters referred to them by a number of individual members.

Talks were also given to various bodies by members of the Divisional Council.

W. L. KAY, *Hon. Secretary*

East Midlands Division

Divisional activities were well maintained and supported by the members. Disappointment continued, however, by the slow progress by a few local authorities in the establishment of smoke control areas. The recent official pronouncements regarding improved supplies of solid smokeless fuel should dispel some of the reasons given for the slow-down and it is hoped that authorities, in the black areas particularly, will now make every endeavour to push on with their smoke control programmes.

Three general meetings were held, namely—

Derby—17 March—A Civic welcome was given by the Mayor, (Councillor John Dilworth) who for some years had been a member of the Divisional Council. A tour was made of the factory of International Combustion Limited, and lunch was taken by invitation of the Company. At a meeting in the Council House, Mr. G. Woodward, A.M.Inst.F., gave a paper entitled "Development of Plant to comply with Clean Air".

Creswell—14 April—This meeting was organized with a view to emphasizing the urgency and importance of smoke control in the East Midlands coal-field. The Chairman (Councillor Mrs. D. M. Ashley) invited representatives from women's organizations and 35 organizations appointed delegates. Addresses were given by Dr. D. Davies, Physician Superintendent, Ransom Hospital on "The Medical Aspects of Atmospheric Pollution" and by Mr. T. Henry Turner, Deputy Chairman of the National Society for Clean Air, on "Clean Air Success-Stories, Policies and Actions".

Chesterfield—14 July—At the Annual General Meeting in the Town Hall, Mr. A. Murray, (Staveley U.D.C.) was appointed Chairman, and Councillor W. Everett, (Chesterfield R.D.C.) was appointed Deputy Chairman. The Mayor of Chesterfield (Councillor Tom Bucknall) gave a civic welcome to the members. Mr. A. Bloomfield, Regional Marketing Manager, Coal Products Division of the National Coal Board, presented a paper on the Board's new fuels and a film on the subject was also shown. The afternoon was devoted to a tour of the Avenue Coking and Chemical Plant at Wingerworth.

A. WADE, *Hon. Secretary*

South West Division

1965 brought to fruition two years' of careful consideration by the Bristol and West Clean Air Committee concerning whether, how, and when it would merge into the National Society with which it has always been closely associated.

The Bristol and West had been active since 1945, during which period it had considerably extended the area of representation and it was clearly vital that none of the impetus it had gained should be lost in the transition.

On 7 July members of the Society and of the Bristol and West attended a meeting at Bristol University, called by the Director and presided over by the Chairman of the Executive Council, which both Mr. Goodfellow and Mr. Marsh addressed.

It was agreed to set up a South West Divisional Council with the Bristol and West continuing its good work as its Northern Area Committee. A Provisional Committee of twelve was elected to draft a Constitution with myself as Acting Honorary Secretary.

The Provisional Committee, under the chairmanship of Alderman G. P. C. Ford of Bristol, lost no time in doing this and, on 14 October a joint meeting of the Bristol and West Clean Air Committee and the South West Division of the National Society was held at Berkeley Nuclear Power Station, when the Bristol and West formally reinstated itself as the Northern Area Committee of the Division, with Alderman Ford as Chairman; Councillor W. H. England of Bristol, Vice-Chairman; Mr. G. J. Creech, Chief Public Health Inspector of Bristol, Honorary Secretary, and Mr. G. W. Dhenin, Deputy Chief Public Health Inspector of Bath, as Assistant Secretary. The new constitution for the South West Division was approved. A Northern Area Committee was elected, to which representatives of the various fuel industries and professions and bodies concerned were co-opted.

The Constitution for the South West was formally adopted and the Secretary instructed to notify all former local authority members of the Bristol and West of the new arrangement.

After a welcome from the Nuclear Power Station Superintendent, Mr. F. R. R. Jones, B.Sc.(Eng.), A.M.I.E.E., A.M.I. Mec.E., members were given a description of the works and a talk by the Station Health Physicist, Mr. E. Lewis, B.Sc., A.Inst.P., on "Atmospheric Effluent Disposal from Nuclear Power Stations", and toured the station.

R. V. REDSTON, *Acting Hon. Secretary*

South East Division

Probably the biggest event of the year in the South East was local government re-organization in Greater London. On the 1 April, 1965, after a warming-up period of 12 months, 32 new London Boroughs became fully operative and 87 former local authorities passed out of existence. What effect has this had on the Society and on clean air progress?

From the Society's point of view, the number of local authority members in Greater London has been greatly reduced although most are now paying, on account of their increased population, a higher subscription. The overall effect, however, is a sizeable reduction in income to the Society. In addition two members of the Divisional Council became ineligible for re-election due to their change of status with their new authorities.

Turning from this gloomy side of the picture, it is clear that re-organization has had a beneficial effect on smoke control generally in the Greater London area. Three black areas which formerly had no active programme for setting up smoke control areas have now been brought into comprehensive programmes, whilst a fourth is almost certain to be included in due course. Two districts (not black areas) are now included in new Boroughs' programmes and another similar type of district is almost certain to be included later. In ten cases, new Boroughs aim to make their districts smokeless earlier than all their constituent authorities would have become smokeless, although in another seven cases the target date is now later than that of at least one of the constituent authorities.

At the Annual General Meeting on the 16 November, the Granada film "Bronchitis—The English Disease", which had previously been shown on I.T.V., was shown and Dr. Philip Harvey, Consultant Physician of St. Stephens Hospital, Chlesea, who appeared in the film and was associated with its making, spoke and answered questions.

A very successful general meeting was held on the 3 February when an audience of 140 heard Dr. S. R. Craxford and Mr. W. E. Barnes, F.R.I.B.A., speak on Chimney Heights.

On the 2 April, there was a disappointingly small audience of 40 to hear a most interesting talk on the "Effect of Atmospheric Pollution on St. Paul's Cathedral and the Problems of Cleaning and Restoration" by Paul Paget, F.S.A., F.R.I.B.A., Surveyor to the fabric of the Cathedral. Mr. Paget showed a very fine selection of slides to illustrate his talk.

Five meetings of the Divisional Council were held and it was decided to form a Publicity Sub-Committee with the object, primarily, of increasing membership of the Society.

During the summer a series of visits was arranged to places of interest in the Division, viz, the National Coal Board Housewarming Centre, Edgware; Charrington's mechanized solid fuel depot, Neasden; the Port of London with a trip on the river, tour of Royal Docks and inspection of a liner; the Gas Council's Methane Terminal at Canvey Island. The Divisional Council is greatly indebted to the firms and bodies concerned for the hospitality and facilities provided.

J. S. HODGINS, *Hon. Secretary*

Information About the Society

The forerunners of the Society were the Coal Smoke Abatement Society, established in London in 1899, the Smoke Abatement League of Great Britain (1909) concerned mainly with the Provinces, and the National Smoke Abatement Society, formed in 1929 by the amalgamation of the two parent organizations. At a Special General Meeting held in April 1957, it was agreed unanimously to change the name of the Society to "National Society for Clean Air", and to seek incorporation as a company limited by guarantee, a licence being sought from the Board of Trade to omit the word limited. The Society assumed its new name and status as from 1st January, 1958. For further information about membership, Executive Council and Committees, etc., reference should be made to the Society's Memorandum and Articles of Association and Byelaws.

Divisions

For electoral purposes and where it is desired, area organization, the Society is now composed of the following geographical Divisions: (1) Scotland, (2) Northern Ireland, (3) North West, (4) North East, (5) Yorkshire, (6) West Midlands, (7) East Midlands, (8) South West, (9) South East, (10) South Wales and Monmouthshire. (See Byelaws for the Counties in each Division).

Membership

The Society is wholly dependent on the contributions of its members for the growth and the maintenance of its work, and invites the support of all who sympathize with and wish to promote its objects. These are stated in full in the Memorandum of Association, but they may be briefly summarized as the securing throughout the United Kingdom of the maximum of natural light and air free from every form of pollution, particularly that arising from the combustion of fuel. There are three main classes of membership—for individuals, local authorities, and corporate bodies such as firms, public undertakings and institutions. Individual members and the representatives of other members have rights of nomination and voting in elections for Officers and Council. They receive, free of charge, the Society's quarterly journal *Smokeless Air* and other publications. Local authority and corporate full members are also entitled to receive one *extra* copy of *Smokeless Air* and the Society's Year Book for each guinea by which their subscription exceeds three guineas. Corporate members who have branches or offices in Divisions of the Society other than that in which their Registered Office is situated may appoint Delegates to participate in the activities of those Divisions. Members are entitled to receive assistance and information on problems relating to air pollution. In addition to receiving notices of meetings and conferences organized nationally, they are entitled to participate in any activities organized by or within their Division.

Associates

Any individual, local authority, institution or corporate body contributing less than the appropriate membership subscription may become an *Associate*, entitled to some of the privileges of membership, but not to those relating to nomination, voting and election to office.

Subscriptions

INDIVIDUAL MEMBERS—Not less than £1 1s. 0d. a year.

LOCAL AUTHORITY MEMBERS—Not less than the following amounts, according to populations:

Less than 25,000	..	6 guineas
25,000 to 50,000	..	8 ,,
50,001 to 75,000	..	10 ,,
75,001 to 100,000	..	15 ,,
100,001 to 250,000	..	25 ,,
250,001 to 500,000	..	36 ,,
Over 500,000	..	48 ,,

CORPORATE MEMBERS (which includes Companies, Firms, and Departments of Local Authorities)—Not less than 25 guineas for members appointing two Representatives; not less than 15 guineas for members appointing one Representative.

(Under Article 5 (e) (ii) of the Society's Articles of Association, an Association or firm which is not incorporated can appoint representatives to act on its behalf, and obtain all the benefits of Corporate Membership.)

SUSTAINING MEMBERS—A Member in any class subscribing not less than £100 a year. (See list page 70.)

SPECIAL CASES—The Executive Council may consider applications for membership on special terms as to subscriptions and otherwise. This rule is intended to apply in particular to local and other small voluntary associations wishing to become Corporate Members.

Associates—Any sum that is less than the appropriate subscription for membership.

Donations—The Society will be pleased to receive single or annual donations for any amounts from non-members.

Publications — Annual subscriptions may be made for *Smokeless Air* and for other publications as issued.

Payment of Subscriptions—The first subscription should be forwarded with application for membership. This may be sent at any time, and the subscription remains in force until the first day of the corresponding month of the following year. It is mutually advantageous if subscriptions are made by Banker's Order.

Covenant Donations—Annual contributions to the Society may be made under covenant, the Society being recognized as a "charity" by the Commissioners of Inland Revenue for this purpose. By signing an agreement to subscribe a stated sum for a period of at least seven years the Society may claim the amount of income tax that has been paid on such contributions, thereby increasing the benefit it receives without additional cost to the donor. Further particulars and form of covenant will be forwarded on request.

Representatives and Delegates

Local authority and Corporate Members are entitled to appoint Representatives to exercise on their behalf the rights of membership with regard to nomination for office, voting, receipt of publications, etc. Corporate Members may appoint one or two representatives each, according to subscription, and Local Authority Members a number according to population, as follows:

Less than 100,000	2
100,001 to 250,000	3
250,001 to 500,000	4
500,001 and over	5

Note: The Delegates mentioned previously participate in the activities of the Society *only* at Divisional level. A member's Representative exercises all the rights to which a member is entitled.

The names and addresses of Representatives should be forwarded on making application for membership, so that they may be entered in the Voting Registers.

Services to Members

Information and Advice

Advice, assistance and information on matters relating to atmospheric pollution and its prevention is available free of charge to Members, provided that, where necessary, the request is approved by the Executive Council. If the information required is not immediately available to the Society's Information Department, the Society is prepared, on behalf of a Member, to obtain it from one of the specialized Information Bureaux.

Library

The Society's Library is available for the use of all Members. It possesses classified files of Press cuttings, and an extensive collection of both British and foreign books, reports and pamphlets on air pollution and related subjects. In some cases, the Society is the only organization in the United Kingdom receiving the publication. Books and other publications are issued on loan, or may be consulted in the Society's offices. The Society is linked with various specialist and technical libraries, and when a publication relating to some special aspect of air pollution is not in the library, the Society can often borrow it through other sources. Applications should be made initially to the Librarian.

Lectures

The Society will be pleased to help members and others in any part of the country to arrange lectures and talks of all kinds on atmospheric pollution and related subjects. A panel of speakers, arranged regionally, is being prepared and will be supplied on request.

Slides

A library of 35 mm. transparencies covering all aspects of air pollution is in course of preparation. The slides will be available on loan. Details on request.

Films

The Society does not possess films or film strips for loan, but a comprehensive list of films available from other sources is given elsewhere in this Year Book.

Exhibitions

The Society is ready to consider participating in exhibitions, and has a supply of display material and portable exhibition units for loan. The range of material is quite large, and to help members select exhibits suitable for their requirements, an illustrated catalogue has been prepared, which will be sent to those interested, on request.

Demand for this material is heavy particularly in spring and autumn, and it is advisable that inquiries should be made as early as possible in advance.

No charge is made for the loan of the material other than the cost of carriage. In order to keep these carriage charges to the minimum, some of the larger units have been distributed to the following Divisions: Scottish, North East, North West, Yorkshire, East Midlands, West Midlands, and in addition two units are kept at headquarters. Full details can be obtained from the Hon. Secretaries of the respective Divisions or from the Exhibitions Officer.

Publicity Advisory Service

The Society's Publicity Advisory Service is available to help Local Authorities and Corporate Members with their Clean Air Publicity, especially when Smoke Control Orders are pending.

The Service advises members on display material, its arrangement for exhibitions, stands, etc., gives guidance on the general organization of exhibitions and advises and supplies information on other publicity activities such as public meetings, local press features and correspondence, educational work in schools, women's organizations, etc.

No charge is made for this service to members.

Exhibition Display Material

The Society has an exhibition display unit available for loan by local authorities and corporate members. Known as the "Speedframe Display", it consists of metal tubes which can be built up into a number of different shaped free-standing displays, to which are attached 30 ins. x 24 ins. display panels. The display comprises of eight panels as follows:

Clean Air and Health
Clean Air and the Home
Clean Air and the Cost of Living
Clean Air and Industry
Clean Air and the Vehicle
Clean Air and the Future
and two plain coloured panels

The complete display measures 10 ft. x 2 ft. x 7 ft. and incorporates a 2 ft. x 2 ft. table for literature. It requires ten travelling cases to transport and will be sent by rail or road service vehicles.

In addition to the four information panels (catalogue reference I.P. I I.P.4), framed panels under perspex are available: Details of all these panels will be sent on request.

"Do-It-Yourself" Display Kits

The provision of these kits to members will be of value to local authorities who are staging their own exhibitions. Each pack will consist of six display photographs, size 18 ins. x 15 ins. approximately, mounted on board, together with appropriate captions and headings, printed on card.

At present two different kits are available at a nominal charge of 10s. each to cover postage and packing costs.

DIY.1 *Six Reasons for Smoke Control.*
DIY.2 *Why Clean Air For Me?*—Answers to some of the arguments put forward by householders against smoke control.

Posters

The Society has a number of coloured and line posters available, ranging in price from 1s. 9d. per copy (double crown) to £7 10s. per 100 copies (with a reduction for Members). Crown line posters cost 8d. per copy to £2 8s. for 100 copies.

The full list of posters available is as follows:

No. 1. *Smoke Spells Danger*
No. 2. *Clean Air is Your Affair*
No. 3. *It's Better Up Here . . .*
No. 4. *Prevent Air Pollution—Britain's Biggest Headache*
No. 5. *Smokeless Zones—Cleaner Homes*
No. 6. *Away with Smoke—Let in the Light*
No. 7. *They Didn't Know What to do!* (*Crown size only*)
No. 8. *We Have the Answer to Smoke.* (*Crown size only*)
No. 9. *These are the Things that Smoke Does.*
Nos. 10 and 11 *For Clean Air*—Poster designed for local overprinting (Double Crown and Crown sizes available).

Literature

Inquiries are invited on the supply of publications, give-away leaflets, etc., for special purposes. Particulars of these are given below and also in the Society's "Guide to Publications", on another page.

(1) "Descriptive Summary of the Clean Air Act." 6d. per single copy (by post 8d.), 4s. 6d. per dozen, or £1 10s. per 100.
(2) "Facts About Smoke." 16s. per 100, or £6 10s. per 1,000.
(3) "They Didn't Know What to do." 4s. per 100, or £1 10s. per 1,000.
(4) "Clean Air Begins at Home". 15s. per 100, or £6 per 1,000.
(5) "Smoke Affects Your Health & Your Wealth." 15s. per 100, or £6 per 1,000.
(6) Clean Air Cheques.—The cost of air pollution, stated simply and concisely on an imitation cheque form. £2 10s. per 1,000.
(7) Clean Air Bookmarks—4s. per 100, 30s. per 1,000.
(8) Clean Air: Notes for Teachers and Lecturers. 1s. 6d. (1·10) per copy 15s. 6d. per dozen.

Photographs

The Society has a classified and indexed collection of smoke and other photographs, which are suitable for reproduction and/or exhibition purposes. Prints may be inspected at the Society's offices, or a selection will be sent by post if details of requirements are given. The copyright in the photographs is retained by the photographer, and where reproduction fees are chargeable, the inquirer should communicate with the photographer.

New photographs of high pictorial quality, with reproduction rights, are required, either as gifts or for payment at standard rates.

Wall Chart

For school use. 44 ins. x 25 ins. (2s. including Lecture Notes)

Summary of Divisional Accounts

For the year ended December 31, 1965

Division	*Commencing balance*			*Other Grants*			*Income*			*Expenditure*			*Closing balance*		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Scotland	181	10	4	100	0	0	400	18	6(*a*)	492	15	3	189	13	7
Northern Ireland ..	294	17	8		—		70	0	0(*b*)	285	2	5(*b*)	79	15	3
North West	14	11	11	175	0	0	13	10	1	176	14	6	2	16	4
	Debit												*Debit*		
North East	35	15	9	30	0	0	1	4	10	5	17	3	61	3	4
Yorkshire	53	2	0	40	0	0		—		49	15	2	43	6	10
West Midlands ..	94	16	3	65	0	0		—		53	17	0	105	19	3
East Midlands	10	4	0	75	0	0		—		78	11	9	6	12	3
South West		—			—			—		2	17	6	2	17	6
													Debit		
South East	13	2	4	100	0	0		10	0	116	10	9	2	18	5
													Debit		
South Wales & Mon. ..	90	19	10		—		15	15	0	35	5	6	71	9	4
Totals ..	759	16	3	585	0	0	501	18	5	1,297	7	1	549	7	7

Notes: (*a*) includes fees and expenses for Annual Conference and Firemen's Classes.
(*b*) includes fees and expenses for Exhibition.

NATIONAL SOCIETY FOR CLEAN AIR

(Limited by Guarantee—Incorporated 1 January, 1958)

Balance Sheet as at 31 December, 1965

1964 £		£	£
	GENERAL FUND		
14,612	Balance as at 1 January, 1965		16,680
2,068	*Add:* Surplus for the year		3,438
16,680			20,118
	PREMISES RESERVE FUND		
2,667	Balance as at 1 January, 1965	3,667	
1,000	*Add:* Transfer from Income and Expenditure Account	1,000	
3,667			4,667
	JOHN STANLEY SEVERS LEGACY FUND		
	Balance at 1.1.65	5,187	
	Less: Transfer to Information and Publicity Services Account	2,000	
5,187			3,177
25,534			27,972
	CURRENT LIABILITIES		
2,302	Sundry Creditors and Accrued Expenses ..		1,642
£27,836			£29,614

Stanley E. Cohen, *Honorary Treasurer*

Arnold Marsh, *Director and Secretary*

1964 £		£	£
	FIXED ASSETS		
	Office Equipment and Furniture ..		Not Valued
	INVESTMENTS AT COST		
5,073	Government and Corporation Stocks ..	5,074	
5,041	Other Fixed Interest Stocks	3,945	
3,647	Ordinary Shares	4,743	
13,761			13,762
	(Market Value 31/12/65 £13,573 Market Value 31/12/64 £13,188)		
	CURRENT ASSETS		
409	Stock of Posters, Charts, etc. at Valuation ..	729	
2,371	Sundry Debtors and Prepayments	2,270	
	Balances at Bank:		
10,372	Deposit Account	12,288	
855	Current Account	500	
68	Cash in Hand	65	
14,075			15,852
£27,836			£29,614

Income and Expenditure Account for the year ended 31 December, 1965

1964 £	EXPENDITURE	£	£
9,732	Salaries and Wages		10,306
1,442	Staff Pension Scheme		1,469
1,995	Rent, Rates, Light and Heat		2,052
1,861	Travelling, Insurance, Cleaning and General Expenses		2,315
183	Office Equipment and Furniture		232
553	Stationery and Supplies		474
3,633	*Smokeless Air* and Year Book Printing, Postage etc.	3,651	
3,059	*Less:* Receipts from Advertisements	3,308	
574			343
1,846	Information and Publicity Services and cost of Publications	2,869	
—	*Less:* Amount paid from John Stanley Severs Legacy	2,000	
1,846			869
585	Divisional Grants		585
18,771			18,645
	EXCESS OF INCOME OVER EXPENDITURE		
1,000	Transfer to Premises Fund	1,000	
2,068	Balance to General Fund	3,438	
3,068			4,438
£21,839			£23,083

1964 £	INCOME	£	£
14,219	Subscriptions and Donations		14,595
4,152	Confeence Fees	4,139	
3,394	*Less:* Expenses	2,904	
758			1,235
9,769	Exhibition Income	8,448	
4,915	*Less:* Expenses	3,544	
4,854			4,904
1,056	Sales of Publications		1,042
	INVESTMENT INCOME		
457	Taxed Dividends	522	
167	Income Tax Repayment	244	
328	Bank Deposit Interest	541	
952			1,307
£21,839			£23,083

REPORT OF THE HONORARY AUDITORS TO THE MEMBERS OF THE NATIONAL SOCIETY FOR CLEAN AIR

We have obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of the Audit. In our opinion proper books of account have been kept by the Society so far as appears from our examination of those books. We have examined the Balance Sheet and annexed Income and Expenditure Account which are in agreement with the books of account. In our opinion and to the best of our information and according to the explanations given to us the said accounts give the information required by the Companies Act, 1948, in the manner so required and the Balance Sheet gives a true and fair view of the state of the Society's affairs as at 31 December, 1965, and the Income and Expenditure account gives a true and fair view of the surplus for the year ended on that date.

7 *March*, 1966

GEO. LITTLE, SEBIRE & CO., *Chartered Accountants.*
Adelaide House, London Bridge, London, E.C.4. *Hon. Auditors.*

Subscriptions and Donations

January 1st to December 31st, 1965

* Denotes Covenant Donor

(2) denotes two Subscriptions received during the year

Scottish Division

	£	s.	d.
Aberdeen Corporation	26	5	0
Airdrie Corporation	8	8	0
Ardrossan Corporation	6	6	0
Ayr County Council	5	0	0
*Barclay-Smith, Lt. Col. E. A.	1	1	0
Barrhead Corporation (2)	12	12	0
Broadbent, J.	2	0	0
Clackmannan County Council	8	8	0
Clydebank Corporation	10	10	0
Coatbridge Corporation	10	10	0
Cooper, F. T.	1	1	0
Currie, T. S.	1	1	0
Dumbarton Corporation	6	6	0
Dumfries Corporation	8	8	0
Dunbarton County Council	26	5	0
Dundee Corporation	26	5	0
Dunfermline Corporation	8	8	0
East Kilbride Development Corpn.	7	7	0
East Kilbride Corporation	8	8	0
Edinburgh Corporation	37	16	0
Falkirk Corporation	8	8	0
Fife County Council	26	5	0
Francis, S. H.	1	1	0
Gibb, Dr. W.	1	1	0
Glasgow Corporation	50	8	0
Glasgow Tree Lovers' Society	1	1	0
Grangemouth Corporation	6	6	0
Grattidge, H. H.	1	1	0
Hamilton Corporation	4	4	0
Hawick Corporation	6	6	0
Howden, James & Co. Ltd.	26	5	0
Hughes, H. S.	1	1	0
Hunter, R.	1	1	0
Inverness County Council	10	10	0
Inverness Corporation	8	8	0
Irvine Corporation	6	6	0
Johnstone Corporation	6	6	0
Kilmarnock Corporation (2)	16	16	0
Kilsyth Corporation	6	6	0
Kirkcaldy Corporation	10	10	0
Kirkintilloch Corporation	6	6	0
Lanark County Council	37	16	0
Motherwell & Wishaw Corporation	10	10	0
North of Scotland Hydro-Electric Board	15	15	0
Page, J.	1	1	0
Paisley Corporation	15	15	0
Park, W. Y.	1	1	0
Perth County Council	3	3	0
Perth Corporation	8	8	0
Port Glasgow Corporation (2)	4	4	0
Renfrew County Council	12	12	0
Renfrew Corporation	6	6	0
*Renwick, Dr. and Mrs. J.	1	0	0
*Ritchie, G. B.	1	1	0
Rothesay Corporation	6	6	0
Royal Sanitary Asscn. of Scotland	15	15	0
Rutherglen Corporation	6	6	0
Scottish Gas Board	73	10	0
Scott Park, Dr. and Mrs. S. D.	1	1	0
Scotsman Publications Ltd.	8	8	0
Shankland, Mrs. R.	0	15	0
Slimming, D. W.	1	5	0
Smith & Wellstood Ltd.	1	1	0
South of Scotland Elec. Board	50	0	0
Stirling County Council	26	5	0
Stirling Corporation	8	8	0
Strump, G.		10	6
Tucker, P.	1	1	0
Waldie, J. & Sons Ltd.	1	1	0
West Lothian County Council (2)	16	16	0
Wightman, Mrs. U. N.	1	1	0

Northern Ireland Division

	£	s.	d
Antrim County Council	5	5	0
Ballymena Corporation	6	6	0
Belfast Corporation	37	16	0
British Electrical Dev. Asscn. Nthrn, Ireland Area Cttee.	15	15	0
Carey, Dr. G. C. R.	1	1	0
Coal Advisory Service	15	15	0
Davidson & Co. Ltd.	15	15	0
Edwards, Dr. M. D.	1	1	0
Edwards, T. G.	1	1	0
Electricity Board for Northern Ireland	15	15	0
*Ellison, C. A.	1	10	0
Guinness, Arthur Son & Co. (Belfast) Ltd.	15	15	0
Knox, Dr. E. W.	1	1	0
Londonderry Corporation	10	10	0
Lynas, K. H.	1	10	0
Magee, J. L.	1	1	0
McAlery, Cllr. Miss I. M. E.	1	1	0
McCutcheon, N.	1	1	0
Millar, J.	1	1	0
Muske, W. J.	1	1	0
Northern Ireland Housing Trust	15	15	0
O'Brien, W. E. C.	1	5	0
Ormeau Bakery Ltd.	15	15	0
Peel, R.	1	1	0
Pemberton, Professor J.	1	1	0
Porter, Colonel H. J.	2	2	0
Reynolds, A.	1	10	0

North West Division

	£	s.	d
Abram U.D.C.	6	6	0
Accrington Corporation	8	8	0
Affleck & Brown Ltd.	2	2	0
Aitkenhead, Miss M.	1	0	0
Altrincham Corporation	8	8	0
Amende, H. F.	1	0	0
Anonymous	20	0	0
Ashton Bros. & Co. Ltd.	2	2	0
Ashton-in-Makerfield U.D.C.	6	6	0
Ashton-under-Lyne Corporation (2)	21	0	0
Atherton U.D.C.	6	6	0
Audenshaw U.D.C.	6	6	0
Bacup Corporation	6	6	0
Barnes, Cllr. W.	1	1	0
Barrow-in-Furness Corpn.	10	10	0
Baxendale & Co. Ltd.	2	2	0
Bayes, Alderman Mrs. M.	3	3	0
*Beard, E.	2	17	0
Beattie, E. & F. Ltd.	1	1	0
Bebington Corporation	10	10	0
Behrens, A.		10	0
Bibby, H. P.	2	2	0
Bibby, J. & Sons Ltd.	15	15	0
Birkenhead Corporation	2	2	0
Blackburn Corporation	26	5	0
Blackpool Corporation	26	5	0
Bolton Corporation	26	5	0

	£	s.	d.
Bootle Corporation	12	12	0
Bredbury & Romiley U.D.C.	6	6	0
Brierfield U.D.C.	6	6	0
British Insulated Callenders Cables Ltd.	15	15	0
Brough, J. B.	1	1	0
*Brown, P. S.	1	1	0
Burnley Corporation (2)	31	10	0
Bury Corporation	10	10	0
Buxton Corporation (2)	12	12	0
Chadderton U.D.C.	8	8	0
Cheadle & Gatley U.D.C.	8	8	0
Cheshire County Council	50	8	0
Chester R.D.C.	8	8	0
Chorley Corporation (2)	16	16	0
Christian, F. V.	1	1	0
Church U.D.C.	6	6	0
Clarke, Mrs. M.	1	1	0
Clegg, E.	1	0	0
Clitheroe Corporation	3	3	0
Clusky, H.	1	1	0
Colne Corporation	6	6	0
Community Council of Lancashire	2	2	0
Connah's Quay U.D.C.	6	6	0
Cooper, Miss I.	1	1	0
Cotton, Cllr. S. A.	1	1	0
Coulthard, Miss D. (2)	2	2	0
Crewe Corporation	10	10	0
Crompton U.D.C.	6	6	0
Crosby Corporation	3	3	0
Cumberland County Council	5	0	0
Darwen Corporation	8	8	0
Denton U.D.C.	8	8	0
Diamond, Miss P.	1	1	0
Droylsden U.D.C.	8	8	0
Duguid, S.	3	3	0
Duguid, Mrs. S. N.	1	1	0
Dukinfield Corporation	6	6	0
Eccles Corporation	8	8	0
Ellesmere Port Corporation	8	8	0
Failsworth U.D.C.	6	6	0
Fallows, W. B.	1	1	0
Farnworth Corporation	8	8	0
Farquharson, G. W.		15	0
Ferranti Ltd.	21	0	0
Fleetwood Corporation	8	8	0
Franklin, N. J.	1	1	0
Fulwood U.D.C.	6	6	0
Furness District Federation of Owner-Occupiers' Asscns.	2	2	0
Gee, J.	1	1	0
Glossop Corporation	6	6	0
Golborne U.D.C. (2)	12	12	0
Graham, Mrs. E. M.	1	1	0
*Graham, G. M.	1	0	0
Great Harwood U.D.C.	6	6	0
Hale U.D.C.	6	6	0
Hall & Pickles Ltd.	15	15	0
Hall, A.	1	10	0
Hall, E. N. (2)	2	2	0
Halliday, A. C.	1	10	0
Hallows, V. K.	1	1	0
Haslingden Corporation	6	6	0
Haydock U.D.C.	6	6	0
*Hayhurst, H.	1	1	0
Hazel Grove & Bramhall U.D.C.	6	6	0
*Heald, Dr. G. E.	1	1	0
Hendy, Dr. B.	1	1	0
Hetherington, H.	1	1	0
Hewitt, F.	1	1	0
Heywood Corporation	8	8	0
Hindley U.D.C.	6	6	0
Horwich U.D.C.	6	6	0
Hoylake U.D.C.	5	5	0
Huyton-with-Roby U.D.C.	10	10	0
Hyde Corporation	8	8	0
Ince-in-Makerfield U.D.C.	6	6	0
Irlam U.D.C.	6	6	0
Jackson, C. L.	1	1	0
Jewsbury, S.	1	1	0
Kearsley U.D.C.	6	6	0
*Keddie, Dr. J. T. Chalmers	1	1	0

	£	s.	d.
Kerr, J.	3	3	0
Kirk, W. R.	1	1	0
Kirkby U.D.C.	10	10	0
Kitchener, The Rt. Hon. The Earl	1	0	0
Lancashire County Council	52	10	0
Lancashire & District Coke Distributors' Asscn.	26	5	0
Lancaster Corporation	8	8	0
Lane, Mrs. W. (2)	2	2	0
Langford, A. S.		10	6
Lees U.D.C.	6	6	0
Lees, Miss M.	1	1	0
Leigh Corporation	8	8	0
Leyland U.D.C.	6	6	0
Littleborough U.D.C.	6	6	0
Liverpool Corporation	50	8	0
Longdendale U.D.C.	6	6	0
MacWilliam, Dr. H. H.		15	0
Macclesfield Corporation	8	8	0
*Macnair, A. S.	1	1	0
Manchester Corporation	50	8	0
Manchester & District Regional Clean Air Council	15	15	0
Marple U.D.C.	6	6	0
Martindale, J. R. L. (2)	2	2	0
Martindale, R. L. (2)	2	2	0
*Mather, W. L.	1	0	0
Mather & Platt Ltd.	50	0	0
Matlock U.D.C.	6	6	0
Mercer & Sons Ltd. (2)	2	2	0
Merseyside & North Wales Elec. Board	40	0	0
Middleton Corporation	10	10	0
Mitchell, L. A.	1	1	0
Mold U.D.C.	6	6	0
Moore, H. (2)	2	2	0
Morecambe & Heysham Corpn.	8	8	0
Nantwich U.D.C.	6	6	0
National Federation of Owner-Occupiers' & Owner-Residents' Associations (2)	6	6	0
Nelson Corporation	8	8	0
Newton-le-Willows U.D.C. (2)	12	12	0
Northern Gas Board—			
Carlisle	1	11	6
Penrith		10	6
Workington	1	11	6
North Western Elec. Board	62	0	0
North Western Gas Board	105	0	0
Northwich R.D.C.	8	8	0
Northwich U.D.C.	6	6	0
*Norwood, Mrs. D. B.	1	1	0
Oldham Corporation	26	5	0
Ormskirk U.D.C.	6	6	0
Padiham U.D.C.	6	6	0
Pike, Miss I. M.	1	1	0
Polding, W. W.		10	6
Preston Corporation	26	5	0
Preston R.D.C.	8	8	0
Prestwich Corporation	8	8	0
Radcliffe Corporation	8	8	0
Rae, Cllr. K. F.	1	1	0
Ramsbottom U.D.C.	6	6	0
Rawtenstall Corporation	8	8	0
Refuge Assurance Co. Ltd.	12	12	0
Rhyl U.D.C.	6	6	0
Rishton U.D.C.	2	2	0
Rochdale Corporation	15	15	0
Royton U.D.C. (2)	12	12	0
Runcorn R.D.C.	8	8	0
Runcorn U.D.C.	8	8	0
St. Helens Corporation	26	5	0
Sale Corporation	8	8	0
Salford Corporation	26	5	0
*Scott, Mrs. A. O.	1	0	0
Shaw, Mrs. M.	1	1	0
Skelmersdale U.D.C.	6	6	0
Smith, Cllr. Wm.	1	1	0
South-East Lancs. & North Cheshire Consultative Committee for the Investigation of Atmospheric Pollution	2	2	0

	£	s.	d.
Southport Corporation	1	1	0
Stalybridge Corporation	6	6	0
Standish-with-Langtree U.D.C.	6	6	0
Stanyard, R. J.	1	1	0
Stockport Corporation	26	5	0
Stretford Corporation	10	10	0
Summers, John & Sons Ltd.	26	5	0
Swinton & Pendlebury Corpn.	8	8	0
Taylor, Mrs. A. E.	1	1	0
Taylor, Mrs. E.	1	1	0
Taylor, S.	1	1	0
Taymar Ltd.	2	2	0
Thomas, F. L.	1	0	0
Thornton Cleveleys U.D.C. (2)	10	10	0
Thorpe, J. A.	1	1	0
Tillotsons Newspapers Ltd.	15	15	0
Tintwistle R.D.C.	2	2	0
Topham, Mrs. D. A.	1	1	0
Turner, J.	5	0	0
Tyldesley U.D.C.	6	6	0
Up Holland U.D.C.	6	6	0
Urmston U.D.C. (2)	16	16	0
*Vanstone, H. B.	1	16	0
Viney, N. H.	1	1	0
Wallasey Corporation	26	5	0
Warrington Local Medical Cttee.	2	2	0
Warrington R.D.C.	2	2	0
West Lancashire R.D.C.	1	1	0
Whiston R.D.C.	8	8	0
Whitefield U.D.C.	6	6	0
Whitworth U.D.C.	6	6	0
Widnes Corporation	10	10	0
Wigan Corporation	15	15	0
*Williams, W. B.	1	0	0
Williamson, J. G.		15	0
Wilmslow U.D.C.	6	6	0
Winsford U.D.C.	8	8	0
Wood, Mrs. C.	1	1	0
Workington Corporation	8	8	0
Worsley U.D.C.	8	8	0
Wrexham Corporation	8	8	0
Wrexham R.D.C.	10	10	0

North East Division

	£	s.	d.
Allott, S.		15	0
*Angus, Colonel E. G.	3	3	0
Ashington U.D.C.	8	8	0
*Atkinson, E.		15	0
Atkinson, H.		15	0
Barnard Castle R.D.C. (2)	12	6	0
Bedlingtonshire U.D.C.	8	8	0
Billingham U.D.C.	6	6	0
Bird, D.	1	1	0
Bishop Auckland U.D.C. (2)	16	16	0
Blaydon U.D.C.	8	8	0
Bradley, R. M.	1	1	0
Brandon & Byshottles U.D.C.	6	6	0
Bulcock, The Reverend K.	2	0	0
Calvert, Mrs. M. R.	1	10	0
Carr, W.	1	1	0
Castle Ward R.D.C.	6	6	0
Chester-le-Street R.D.C.	8	8	0
Chester-le-Street U.D.C.	6	6	0
Consett U.D.C.	8	8	0
Crook & Willington U.D.C.	8	8	0
Darlington Corporation	7	7	0
Dorman, Long & Co. Ltd.	15	15	0
Durham R.D.C.	8	8	0
Eston U.D.C.	8	8	0
Felling U.D.C. (2)	16	16	0
Fletcher, D. R.	1	1	0
Gateshead Corporation	26	5	0
Hartlepool Corporation	6	6	0
Head Wrightson & Co. Ltd. (2)	31	10	0
Head Wrightson Iron & Steel Works Eng. Ltd.	26	5	0
Hebburn U.D.C.	6	6	0
Hetton U.D.C. (2)	12	12	0
Imperial Chemical Industries Ltd. (Agricultural Divn.)	15	15	0
*Issac, Professor P. C. G.	1	1	0
Jarrow Corporation	8	8	0
Lanchester R.D.C.	6	6	0
Longbenton U.D.C. (2)	16	16	0
Middlesbrough Corporation	26	5	0
Newburn U.D.C.	8	8	0
Newcastle-upon-Tyne Corpn.	37	16	0
North Eastern Elec. Board	35	0	0
Northern Coke Distributors' Asscn.	15	15	0
Northern Gas Board:			
Blyth	1	1	0
Darlington	3	3	0
Hexham		10	6
Middlesbrough	4	4	0
Newcastle-upon-Tyne	21	0	0
Stockton-on-Tees	4	4	0
Sunderland	4	4	0
Northumberland City Council	37	16	0
Orchard, G. W.	1	1	0
Prudhoe U.D.C. (2)	12	12	0
Redcar Corporation	8	8	0
Ryton U.D.C.	6	6	0
Saltburn & Marske-by-the-Sea U.D.C.	6	6	0
Seaham U.D.C.	8	8	0
Sedgefield R.D.C.	8	8	0
Shildon U.D.C.	6	6	0
Skelton & Brotton U.D.C.	6	6	0
Smith, R. D.	1	1	0
South Shields Corporation	26	5	0
Spennymoor U.D.C.	6	6	0
*Spriggs, Dr. E. A.	1	1	0
Stanley (Co. Durham) U.D.C.	8	8	0
Stockton-on-Tees Corpn.	5	5	0
Tate, G. W.	1	1	0
Thornaby-on-Tees Corpn.	6	6	0
Tynemouth Corporation	10	10	0
University of Newcastle/Tyne	3	3	0
Wallsend Corporation	8	8	0
Washington U.D.C.	6	6	0
Watson, W. P.	1	1	0
West Hartlepool Corpn.	15	15	0
Whickham U.D.C.	6	6	0
Whitley Bay Corporation	8	8	0

Yorkshire Division

	£	s.	d.
Adwick-le-Street U.D.C. (2)	12	12	0
Aireborough U.D.C.	8	8	0
Atkinson, C. A. P. (2)	2	2	0
Barnsley District Coking Co. Ltd.	15	15	0
Batley Corporation	8	8	0
Bentley-with-Arksey U.D.C.	6	6	0
Bingley U.D.C.	6	6	0
Boyd, Miss A. D.	1	1	0
Bradford Corporation (2)	75	12	0
Bradford Civic Society	3	3	0
Bridlington Corporation	8	8	0
Brighouse Corporation	8	8	0
Brown, G. L.	2	2	0
Burn, Dr. A. Telford	1	1	0
Castleford Corporation	8	8	0
Clayton, Son & Co. Ltd.	2	2	0
Coke Oven Managers' Asscn.	5	5	0
Colne Valley U.D.C.	6	6	0
Conisbrough U.D.C. (2)	12	12	0
Cudworth U.D.C.	6	6	0
Darton U.D.C.	6	6	0
Dearne U.D.C.	6	6	0
Denby Dale U.D.C.	6	6	0
Dewsbury Corporation	10	10	0
Doncaster Corporation	15	15	0
Doncaster R.D.C.	10	10	0
Elland U.D.C.	6	6	0
Etherington, H.	1	1	0
Fleming, I.	1	1	0
Gifford, Dr. P. W. W.	1	1	0
Goodfellow, J.	1	1	0
Green, E. & Son Ltd.	25	0	0
Hackney, E. S.	1	1	0
Halifax Corporation (2)	31	10	0
Hall, J. A.	1	1	

	£	s.	d.
Hargreaves Group Ltd.	15	15	0
Harrogate Corporation	10	10	0
Heckmondwike U.D.C.	6	6	0
Hemsworth R.D.C.	10	10	0
Hemsworth U.D.C.	6	6	0
Hepton R.D.C.	6	6	0
Holmes, W. C. & Co. Ltd.	26	5	0
Holmfirth U.D.C. (2)	12	12	0
Horbury U.D.C.	6	6	0
Horsforth U.D.C.	6	6	0
Hoyland Nether U.D.C.	6	6	0
Huddersfield Corporation	26	5	0
Ilkley U.D.C.	6	6	0
Jenkins, The Reverend P. W.	1	1	0
Jervis, Dr. J. Johnstone	1	1	0
Jones, L.	1	1	0
Jordan, H. H.	1	1	0
Keighley Corporation	2	2	0
Kingston-upon-Hull Corpn.	37	16	0
Knottingley U.D.C.	6	6	0
Law, J.	1	1	0
Leeds Corporation	50	8	0
Lewis, P. D.	1	1	0
Machen, C.	1	1	0
*Marshall, G. C.	1	5	0
McLintock, Dr. S. W.	1	1	0
Meltham U.D.C.	6	6	0
Mexborough U.D.C.	6	6	0
Middlebrook, C. J.	1	1	0
Mirfield U.D.C.	6	6	0
Moore, L.		15	0
Morley Corporation	8	8	0
Normanton U.D.C. (2)	12	12	0
North Eastern Coke Distributors' Association	15	15	0
North Eastern Gas Board	42	0	0
North Riding of Yorkshire County Council	37	16	0
Nu-Swift International Ltd.	50	0	0
Ossett Corporation	6	6	0
Otley U.D.C.	6	6	0
Park Gate Iron & Steel Co. Ltd.	26	5	0
Pontefract Corporation	8	8	0
Pudsey Corporation	8	8	0
Queensbury & Shelf U.D.C.	6	6	0
Rawmarsh U.D.C.	6	6	0
Rotherham Corporation	15	15	0
Royston U.D.C.	6	6	0
Rushton, J. L.	1	1	0
Scarborough Corporation	2	2	0
Scargill, M.	1	1	0
Sharp, A. I.	1	1	0
Sheffield & District Clean Air Committee	50	8	0
Shipley U.D.C.	8	8	0
Skinningrove Iron Co. Ltd.	10	0	0
Skipton U.D.C.	6	6	0
Sowerby Bridge U.D.C.	6	6	0
Spenborough Corporation	8	8	0
Stanley (Yorks.) U.D.C. (2)	12	12	0
Steam Storage Co. Ltd.	1	1	0
Swinton U.D.C.	6	6	0
Todmorden Corporation (2)	12	12	0
Tuckley, Miss B. E.	1	1	0
Underwood, Dr. G.	1	1	0
United Steel Companies Ltd.	50	0	0
Universal Machinery & Services Ltd.	15	15	0
Wakefield Corporation	10	10	0
Wakefield R.D.C.	6	6	0
Warwick, H.	1	1	0
Wath-upon-Dearne U.D.C.	6	6	0
West Riding Clean Air Advisory Council (2)	10	10	0
Whitaker, F. P. G.	1	1	0
Wilson, H.	1	1	0
Wombwell U.D.C.	6	6	0
Wood, F. T.	1	1	0
Worsbrough U.D.C.	6	6	0
Wortley R.D.C.	8	8	0
York Corporation	5	5	0
Yorkshire Electricity Board	67	0	0

West Midlands Division

	£	s.	d.
Aldridge U.D.C. (2)	21	0	0
Barnes, A. J.	1	1	0
Bedworth U.D.C.	8	8	0
Bilston Corporation	8	8	0
Birmingham Corporation	50	8	0
Brierley Hill U.D.C.	10	10	0
Brooke, J. R.	1	1	0
Brownhills U.D.C.	6	6	0
Burton-upon-Trent Corporation (2)	21	0	0
Cadbury Bros. Ltd.	15	15	0
Cannock R.D.C.	8	8	0
Cannock U.D.C.	8	8	0
Comley, A. & Wall Ltd.	1	1	0
Coseley U.D.C.	8	8	0
Coventry Corporation	37	16	0
Cradley Boiler Co. Ltd.	15	15	0
Danks, E. & Co. (Oldbury) Ltd.	26	5	0
Darlaston U.D.C.	6	6	0
Dickinson, S.	1	1	0
Dingley, Alderman W. L.	1	1	0
Donaldson, I. J.	1	1	0
Dudley Corporation	10	10	0
Fletcher, J. P.	1	5	0
Frost, H. & Co. Ltd.	2	2	0
Garner, N. A.	1	1	0
Gibbons Bros., Ltd.	25	0	0
Gibbons, E. B.	10	0	0
Gillett, Mr. & Mrs. J. A. (2)	4	4	0
Gimson, H. & Co., Ltd.	15	15	0
*Grimmett, P. H. G.	1	1	0
Guest, Keen & Nettlefolds Ltd.	50	0	0
G.W.B. Furnaces Ltd. (2)	31	10	0
Halesowen Corporation	8	8	0
Hereford Corporation	8	8	0
Hockton, D.	2	0	0
Kay, W. L.	1	1	0
Kidderminster Corporation	8	8	0
Leamington Spa Corporation	8	8	0
Lichfield R.D.C.	8	8	0
Longley, J. C.	1	1	0
Lowndes, R. B. W.	1	1	0
Martine, Dr. W. R.	1	1	0
Meriden R.D.C.	10	10	0
Midland Counties Coke Distributors' Asscn.	15	15	0
Midlands Electricity Board	66	0	0
Midlands Joint Advisory Clean Air Council	10	10	0
Moore, J. (2)	2	2	0
Moore, Dr. R. M. A.	1	1	0
Newcastle-under-Lyme Corpn.	15	15	0
Nuneaton Corporation	10	10	0
Oldbury Corporation	10	10	0
Owen, A. G.	1	1	0
*Pringle, Dr. E.	1	1	0
Pringle, Dr. J. E.	1	1	0
Redditch U.D.C.	8	8	0
Reynolds, F.	1	1	0
*Reynolds, K.	3	0	0
Rowley Regis Corporation	8	8	0
Rugby Corporation	8	8	0
Rugeley U.D.C.	8	8	0
Sedgley U.D.C.	6	6	0
Seisdon R.D.C.	2	2	0
Smart, R. C.		10	6
Smethwick Corporation	10	10	0
Solihull Corporation	15	15	0
Stafford Corporation	8	8	0
Staffordshire County Council	50	8	0
Steadman, A. T.	1	1	0
Stoke-on-Trent Corporation	37	16	0
Stone R.D.C.	6	6	0
Sutton Coldfield Corpn. (2)	21	0	0
Taylor, Mr. & Mrs. C. B.	2	2	0
Tipton Corporation	8	8	0
Walsall Corporation	26	5	0
Waltho, R. B.	1	1	0
Ward, Mrs. M. G.	1	1	0
Warwick Corporation	6	6	0

	£	s.	d.
Warwick R.D.C.	8	8	0
Warwickshire Clean Air Council (2)	52	10	0
Warwickshire County Council	18	18	0
Wednesbury Corporation	8	8	0
Wednesfield U.D.C.	6	6	0
Wellington (Salop) U.D.C. (2)	6	6	0
West Midland Gas Board	105	0	0
Willenhall U.D.C.	8	8	0
Wolverhampton Corporation	26	5	0
Worcester Corporation	10	10	0

East Midlands Division

	£	s.	d.
Alfreton U.D.C.	6	6	0
Allison, G.	2	2	0
Ambrose, R. F.	2	0	0
Ballard, W. A.	1	1	0
Basford R.D.C.	10	10	0
Beeston & Stapleford U.D.C.	10	10	0
Belper U.D.C. (2)	12	12	0
Bingham R.D.C. (2)	12	12	0
Blaby R.D.C. (2)	16	16	0
Blackwell R.D.C.	8	8	0
Bolsover U.D.C.	6	6	0
Boston Corporation	6	6	0
*Brown, J. A.	1	1	0
Cambridge Corporation	1	1	0
Carlton U.D.C.	8	8	0
Carpenter, The Reverend V. A.		10	6
Chesterfield Corporation	10	10	0
Chesterfield R.D.C.	15	15	0
Clarke, N.	1	1	0
Clay Cross U.D.C.	6	6	0
Clowne R.D.C.	6	6	0
Coalite & Chemical Products Ltd.	300	0	0
Coalville U.D.C.	8	8	0
Cooper, Alderman S.	1	1	0
Corby U.D.C.	8	8	0
Crowther, Dr. J. S.	1	1	0
Davies, Dr. D.	1	1	0
Dearden, Mr. & Mrs. J.	3	0	0
Derby Corporation	26	5	0
Dronfield U.D.C.	6	6	0
Eales, C. D.	1	1	0
Eastern Electricity Board	64	0	0
East Midlands Electricity Board	51	0	0
East Midlands Gas Board	73	10	0
Eastwood U.D.C.	6	6	0
Ford, G. E.	1	1	0
Gainsborough U.D.C.	6	6	0
Grantham Corporation	8	8	0
Great Yarmouth Corporation	10	10	0
Grimsby Corporation	15	15	0
Gurney, J.	5	5	0
Heanor U.D.C. (2)	12	12	0
Hiller, G. A.	1	1	0
Hinckley U.D.C.	8	8	0
Ilkeston Corporation	8	8	0
Ipswich Corporation	26	5	0
Irthlingborough U.D.C.	6	6	0
Kettering Corporation	8	8	0
King's Lynn Corporation	8	8	0
Kirkby-in-Ashfield U.D.C.	6	6	0
Leicester Corporation	37	16	0
Lincoln Corporation	10	10	0
Long Eaton U.D.C.	8	8	0
Loughborough Corporation	8	8	0
Lowestoft Corporation	8	8	0
Low Temperature Coal Distillers Assen.	15	15	0
Mansfield Corporation	10	10	0
Mansfield Woodhouse U.D.C.	6	6	0
McDonald, J. D.	1	1	0
Newark Corporation	6	6	0
Norwich Corporation	26	5	0
Nottingham Corporation	37	16	0
Nottinghamshire County Council	10	10	0
Old Fletton U.D.C.	6	6	0
Orr, J. H.	1	1	0
Pepperdine, Cllr. E. C.	1	1	0
Peterborough Corporation	10	10	0
*Pleister, Miss E. M. J.	1	1	0
Repton R.D.C.	2	2	0
Ripley U.D.C.	6	6	0
Rushden U.D.C.	6	6	0
Scopes, F. V.	1	1	0
Scunthorpe Corporation	10	10	0
Southwell R.D.C.	8	8	0
Staveley U.D.C.	6	6	0
Stewarts & Lloyds Ltd.	50	0	0
Sutton-in-Ashfield U.D.C.	8	8	0
Swadlincote U.D.C.	6	6	0
Tramontini, Mrs. J.	1	1	0
Turner, Miss H. E.	2	0	0
*Turner, T. Henry	2	0	0
Wade, A.	1	1	0
Waring, F. L.	5	5	0
Weldon, Miss G. M.	2	2	0
Wellingborough U.D.C.	3	3	0
West Bridgford U.D.C.	8	8	0
Wilkinson, J. R.	1	10	0
Williams, E. V. H.	1	1	0
Wisbech Corporation	6	6	0
Woodcock, F. Huntly	1	1	0
Worksop Corporation	8	8	0
Worksop R.D.C.	6	6	0
Wright, P. F. (2)	2	2	0

South West Division

	£	s.	d.
Bath Corporation	15	15	0
Best, J. K.	1	1	0
Blampied, F. C.	1	1	0
Bristol Corporation	37	16	0
Bristol & West Clean Air Committee	5	5	0
Cawley, Lady	3	0	0
Cheltenham Corporation	10	10	0
Chudley, J. C.	2	2	0
Colehan, J. E.	1	1	0
Cox, T. L.	1	1	0
Crook, S. C.	1	1	0
Dursley R.D.C.	6	6	0
Gloucester Corporation	10	10	0
Greenwood, T. A. S.		15	0
Harris, J.	1	1	0
Imperial Tobacco Company (of G.B. & Ireland) Ltd.	26	5	0
Kingswood U.D.C.	8	8	0
Knowlson, J. M.	1	1	0
Poole Corporation	2	2	0
Porter, H. M.	1	1	0
Redston, R. V.	1	1	0
*Rodgers, P.	2	2	0
Sodbury R.D.C.	4	4	0
South Western Electricity Board	26	0	0
South Western Gas Board	36	15	0
Stroud U.D.C.	6	6	0
Symonds, A. A.	1	1	0
Tewkesbury Corporation	2	2	0
Thornbury R.D.C.	8	8	0
Trevillion, Mrs. F.	1	1	0
Wakeley, R. W.	1	1	0
Wallis, Mrs. E.	1	1	0
Weston-super-Mare Corporation	2	2	0
West Penwith R.D.C.	6	6	0
Weymouth & Melcombe Regis Corporation	8	8	0
Whiting, G. C.	2	0	0

South East Division

	£	s.	d.
Acworth, Miss E. A.	1	1	0
Acworth, Miss W. B.	5	5	0
Akenhead, A.	1	1	0
Allied Ironfounders Ltd.	26	5	0
Ambuco Ltd.	15	15	0
Amersham R.D.C.	8	8	0
Armstrong, F. W.	1	0	0
Association of Public Health Inspectors	15	15	0
Atkinson, Mrs. M.	1	0	0
Ault, H.	1	1	0
Atkinson, Mrs. M.	1	0	0

	£	s.	d.
Ault, H.	1	1	0
Aylesbury Corporation	8	8	0
Bailey, H. D.	1	1	0
Baird, D. E.	1	1	0
Barash, Dr. M.	1	1	0
Barber, S. S.	1	1	0
Barking, London Borough of	26	5	0
Barnes Corporation	2	2	0
Barnet, London Borough of	37	16	0
Basildon U.D.C.	15	15	0
Bastable, N.	1	1	0
Battersea Corporation	6	11	3
Bearman, Mrs. E.	1	1	0
Beaumont, M..	2	2	0
Beddington & Wallington Corporation	8	8	0
Bedford Corporation	10	10	0
Bedfordshire County Council	37	16	0
Bermondsey Corporation	5	5	0
Bexley Corporation	3	18	9
Bexley, London Borough of	26	5	0
Bishop's Stortford U.D.C.	6	6	0
Bligh, Mrs. M. F.	1	1	0
Bognor Regis U.D.C..	2	2	0
Bonnell, Dr. J. A.	1	1	0
Booth, G. M.	2	2	0
Bottom, D. W.	1	1	0
Boult, Sir Adrian C.	1	1	0
*Boult, Miss O.	1	1	0
Bournemouth Corporation	2	2	0
*Boyd, Miss D.	1	1	0
Braintree R.D.C.	6	6	0
Brennan, Dr. J. J.	1	1	0
Brent, London Borough of	29	1	0
Brighton Corporation	26	5	0
British Electrical Development Asscn.	250	0	0
British Iron & Steel Federation	350	0	0
British Medical Association	26	5	0
British Petroleum Co., Ltd.	100	0	0
British Railways Board	100	0	0
Bromley Corporation	2	12	6
Bromley, London Borough of	37	16	0
Brooks, J. F.	1	1	0
*Brown, A. W.	1	1	0
Bryant, Miss P. M.	1	1	0
Buckle, G. H. & Partners	26	5	0
Buist, Commander C.	10	10	0
Bullingdon R.D.C.	8	8	0
Burke, Dr. S. A.	1	11	6
Bushey U.D.C.	6	6	0
Butler, J. W.	2	2	0
Caller, Dr. S.		10	6
Camberwell Corporation	26	5	0
Camden, London Borough of	26	5	0
Capes, F. B.		15	0
Card, H. T.	1	1	0
Carshalton U.D.C.	2	12	6
Cave, Miss R.	1	1	0
Central Electricity Generating Board	300	0	0
*Chantler, P.	4	4	0
Charrington, Gardner, Locket & Co., Ltd. (2)	31	10	0
Chatfield, A. J.	1	1	0
Chatham Corporation	8	8	0
Chesham U.D.C.	6	6	0
Cheshunt U.D.C.	8	8	0
*Chivers, D. P.		15	0
Clacton U.D.C.	3	3	0
Clarke, Dr. R. T. V.	1	10	0
*Clarke, S. H..	1	0	0
*Clinch, H. G.	1	1	0
Coal Utilisation Council	26	5	0
Collectron Ltd.	15	15	0
College of Fuel Technology	15	15	0
Courtier, G. B.	1	5	0
Cousin, Lt. Col. A. J.	1	1	0
Crawley U.D.C.	8	8	0
Crayford U.D.C.	2	16	0
Crockford, P. D. V.	1	1	0
Croydon Corporation	10	10	0
Croydon, London Borough of	10	10	0
*Damon, W. A.	1	1	0

	£	s.	d.
Dartford Corporation	8	8	0
Dartford R.D.C. (2)	16	16	0
Davies, P. M.	1	1	0
Davis, E. T. A. (2)	2	2	0
Dobson, P. F.	1	0	0
Dover Corporation (2)	16	16	0
Dray, F.	1	1	0
Drummond Dust & Fume Extractors Ltd.	15	15	0
Dust Suppression Ltd.	15	15	0
Ealing, London Borough of	37	16	0
*East, R. G.	1	1	0
Eastbourne Corporation	10	10	0
Eastern Gas Board	42	0	0
Easy Heating Company	15	15	0
*Eaton, Dr. F. J.	3	10	0
Ebben, G.	1	1	0
Egham U.D.C.	8	8	0
Electrical Association for Women	26	5	0
Electricity Council	300	0	0
Elliott, Mrs. M. E.	1	1	0
Elstree R.D.C.	6	6	0
*Elsworthy, J. G.	2	2	0
Enfield, London Borough of	37	16	0
Epping & Ongar R.D.C. (2)	16	16	0
Epsom & Ewell Corporation	10	10	0
Esher U.D.C.	10	10	0
Essex County Council	3	3	0
Esso Petroleum Co., Ltd.	150	0	0
Eton R.D.C.	10	10	0
Farnborough U.D.C.	2	2	0
Federation of British Cremation Authorities	2	2	0
Fell, N. F.	1	1	0
Feltham U.D.C.	10	10	0
Finchley Corporation	2	12	6
Folkestone Corporation (2)	16	16	0
Ford Motor Co., Ltd.	26	5	0
Fox, Dr. R. H.	1	1	0
Franklin, C. Ltd.	2	2	0
Furber, Dr. B. L.	2	2	0
*Gandy, H.	1	10	0
*Gandy, Miss R. L.	2	2	0
Gardiner, P. C.	1	1	0
Garner, A. S.	1	1	0
Gas Council	350	0	0
Gillingham Corporation	10	10	0
*Gillison, Dr. J. A.	2	2	0
Gilpin, A.	1	1	0
Gosport Corporation	1	1	0
Graves, T. G.	1	1	0
Gravesend Corporation (2)	16	16	0
Greater London Council	100	0	0
*Green, J.	1	1	0
Greenwich, London Borough of	26	5	0
Greenwood, Mrs. E. L.	1	1	0
Gresham House Estate Co., Ltd.	15	15	0
Griffel, Dr. W.		10	6
Guildford Corporation (2)	21	0	0
Guildford R.D.C.	10	10	0
Guinness, A. Son & Co. (Park Royal) Ltd.	26	5	0
Hackney, London Borough of	37	16	0
Hales, J. S.	2	2	0
Halsted, V.	1	1	0
Hammersmith, London Borough of	26	5	0
Harlow U.D.C.	8	8	0
Harrold Leather Mfg. Co., Ltd.	1	1	0
Harrow, London Borough of	26	5	0
Hastings Corporation (2)	21	0	0
Havant & Waterloo U.D.C.	8	8	0
Havering, London Borough of	37	16	0
Held, P. E. J. (2)	2	2	0
Hemel Hempstead Corporation	8	8	0
High Wycombe Corporation	8	8	0
*Hillier, Miss E. I.	1	1	0
Hillingdon, London Borough of	26	5	0
Hitchin U.D.C.	6	6	0
Hoddesdon U.D.C.	6	6	0
Holiday Fellowship Ltd.	2	2	0
Hornchurch U.D.C.	8	15	0

	£	s.	d.
Hornsey Corporation	2	12	6
Horsham U.D.C.	6	6	0
Hounslow, London Borough of	26	5	0
Hove Corporation	10	10	0
Hulme, G. H.	1	5	0
Hussey, R.	1	1	0
*Hutton, Dr. K. B.	10	0	0
Imperial Chemical Industries Ltd.	100	0	0
Institute of Fuel	26	5	0
Institution of Gas Engineers	15	15	0
International Combustion (Holdings) Ltd.	21	0	0
International Nickel Company (Mond) Ltd.	15	15	0
*Jackson, P. L.	1	0	0
*James, B. W.	1	0	0
Jellis, F.	1	0	0
Jessel, T. F. H.	3	3	0
Johnson, Alderman A.	2	2	0
Kensington & Chelsea Corporation	3	3	0
Kent County Council	5	5	0
Kershaw, C. A.	1	1	0
Kingston-upon-Thames Corporation	28	7	0
*Kitchin, C. Harcourt	2	0	0
Lambeth Corporation	26	5	0
Lambeth, London Borough of	37	16	0
Langwell, W. H.	1	0	0
Laundon, J. R.	1	1	0
Leagrave Press Ltd.	15	15	0
Leatherhead U.D.C.	2	2	0
*Lee, Sir Kenneth	1	0	0
*Lee, S. A.	1	5	0
Leveson Gower, Miss V.	1	0	0
Lewin, J. Upton	1	1	0
Lewisham, London Borough of	37	16	0
Lister, B. S.	2	0	0
Littlehampton U.D.C.	1	11	6
London (City) Corporation of	50	8	0
London & Counties Coke Distributors' Association	15	15	0
London Electricity Board	59	0	0
London Trades Council	2	2	0
London Transport Board	26	5	0
Lord, D. G.	1	1	0
Luton Corporation	2	2	0
Maidenhead Corporation	8	8	0
Mann, A. C.	1	1	0
Mason, J. K.	1	1	0
Mather, L. E.	2	2	0
Matthews, Dr. N. E.	1	1	0
Medawar, Lady	1	0	0
Melland, B.	1	10	0
Mellins, Mrs. M. H.	1	1	0
Menuhin, Yehudi	1	1	0
Merrin, A. E.	1	1	0
Merton & Morden U.D.C.		17	6
Merton, London Borough of	26	5	0
Metal Box Co., Ltd.	15	15	0
Mitcham Corporation	2	2	0
Mobil Oil Co., Ltd.	26	5	0
Monkhouse, Dr. A. C.	1	1	0
Moore, G. A.	1	1	0
Moreland, S.	1	0	0
Municipal Passenger Transport Asscn. (Inc.)	15	15	0
National Carbonising Co., Ltd.	26	5	0
National Coal Board	1,000	0	0
National Federation of Coke Distributors' Asscns.	26	5	0
New Forest R.D.C.	10	10	0
Newham, London Borough of	5	0	0
Nicholson, D. H.	2	2	0
Nonhebel, Dr. G.	1	1	0
Northfleet U.D.C.	6	6	0
North Thames Gas Board	105	0	0
Orpington U.D.C.	2	12	6
Oxford Corporation	26	5	0
Parker, Dr. A.	5	5	0
Parker, H.	1	1	0
Parkinson, A. C.	1	1	0
Parry, M.		15	0
Pedrick, F.	1	1	0

	£	s.	d.
Penge U.D.C.	2	2	0
Pennington, W. J.	1	1	0
Petrofina (Gt. Britain) Ltd.	26	5	0
Pitstone Amenity Preservation Group	1	1	0
Poole, Mrs. W. M.	1	1	0
Poplar Corporation	3	10	0
Portsmouth Corporation	10	10	0
Potter, Dr. N. M.	1	1	0
Powell Duffryn Heating Ltd.	15	15	0
Preston, Dr. T. W.	1	1	0
Public Transport Association	21	0	0
Radiation Ltd.	31	10	0
Radiovisor Parent Ltd.	21	0	0
Reading Corporation	5	5	0
Redbridge, London Borough of	26	5	0
Reigate Corporation	1	1	0
Richards, J. P.	1	1	0
*Richards, R. L.	4	0	0
Richmond upon Thames, London Borough of	26	5	0
Rickett Cockerell & Co., Ltd.	7	7	0
Rickmansworth U.D.C.	8	8	0
Road Haulage Asscn. Ltd. (2)	31	10	0
*Robinson, Mrs. E.	2	2	0
Rochester Corporation	8	8	0
Rogers, E. C.	1	1	0
Rogers, Miss J. Scott	1	0	0
Roper, R.		10	6
Rosling, Miss E. M.	1	1	0
Royal Society of Health	15	15	0
Rundle, L. G.		15	0
Sansum, Mrs. E. B.	1	1	0
Scorer, Professor R. S.	1	1	0
Shanks, E. C.		15	0
Shaw Scott, G.	1	1	0
Shell-Mex & B.P. Ltd.	150	0	0
Sherfield, Lord	1	1	0
Sittingbourne & Milton U.D.C. (2)	12	12	0
Slough Corporation	10	10	0
Smith, A. R.	5	5	0
Smith, Mrs. P.	1	1	0
Solid Smokeless Fuels Fedn.	52	10	0
Southall Corporation	5	5	0
Southampton Corporation	1	1	0
South Eastern Electricity Board	41	0	0
South Eastern Gas Board	105	0	0
Southend-on-Sea Corporation	2	2	0
Southern Electricity Board	56	0	0
Southern Gas Board	36	15	0
Southwark, London Borough of	37	16	0
Southwick U.D.C.	6	6	0
Sowby, Dr. F. D.	1	1	0
Spoor, Dr. N. L.	1	1	0
Staines U.D.C.	8	8	0
Stansfield, A. F.	1	1	0
Stepney Corporation	15	15	0
Stewart, R. E.	1	5	0
Stoddard, Dr. A.	2	0	0
Strood, R.D.C.	6	6	0
Stubbs, G. C.	1	1	0
Sturtevant Eng. Co., Ltd.	2	2	0
Sugg, Wm. & Co., Ltd.	2	2	0
Sullivan, J. S.	1	1	0
Sutherland, J. W.	1	1	0
Sutton, London Borough of	26	5	0
Swift, S.	1	1	0
Taylor, C. P.	1	1	0
Thurrock U.D.C.	26	5	0
Tiranti, A.		6	0
Todd, G. F.	2	2	0
Toussaint, Dr. C. H. C.	1	1	0
Tower Hamlets, London Borough of	26	5	0
Trianco Ltd.	15	15	0
Triggs, Mrs. A.	1	1	0
Trist, R. & Co., Ltd.	31	10	0
Trueman, Miss M. P.	1	1	0
Tunbridge Wells Corporation	1	1	0
Turner, Dr. W. C.	1	0	0
Vine, Mr. and Mrs. G. M. (2)	4	4	0
Des Voeux, Mrs. M. F.	5	5	0
Waddell, A.		15	0

	£	s.	d.
Wanstead & Woodford Corporation	2	12	6
Ward, Dr. F. A. B.	1	10	0
Watford Corporation	10	10	0
Watford R.D.C.	10	10	0
Watson, Professor H. E.	2	0	0
Wermann, J. C.	1	1	0
Westbrook, J.	1	1	0
West Ham Corporation	1	1	0
Westminster, City of (2)	58	16	0
*White Drummond & Co., Ltd.	3	3	0
White, Dr. H. D. J.	1	0	0
Wigan, H. N.	1	1	0
Willesden Corporation	6	11	3
Willison, Mrs. M. E.	1	1	0
Wimbledon Corporation	2	12	6
Windsor Corporation	8	8	0
Windsor R.D.C.	6	6	0
Winkworth, Mrs. D. M.		5	0
Women's Advisory Council on Solid Fuel	15	15	0
Women's Gas Federation	26	5	0
Woodall-Duckham Construction Co., Ltd.	26	5	0
Wormald, D.	1	1	0
Worthing Corporation	2	2	0
Wright, F. E. S. (2)	2	2	0
Wycombe R.D.C.	8	8	0
Zealley, P. R.	1	1	0

South Wales & Monmouth

	£	s.	d.
Abercarn U.D.C.	6	6	0
Abercwmboi Clean Air Committee	1	1	0
Aberdare U.D.C.	8	8	0
Abertillery U.D.C.	8	8	0
*Bacon, N. P. (2)	4	4	0
Barry Corporation	8	8	0
Bedwas & Machen U.D.C.	6	6	0
Bedwellty U.D.C.	8	8	0
Bridgend U.D.C.	6	6	0
Caerleon U.D.C.	6	6	0
Caerphilly U.D.C.	8	8	0
Cardiff Corporation	37	16	0
Cardiff R.D.C.	8	8	0
Clarke, J. A.	1	5	0
Coal Merchants Federation of Wales	5	5	0
Cwmbran U.D.C.	6	6	0
Ebbw Vale U.D.C.	10	10	0
Fitton, G.	1	1	0
Gellygaer U.D.C.	8	8	0
Glamorgan County Council	50	8	0
Harry, T. W.	1	1	0
Industrial Estates Management Corporation for Wales	15	15	0
Llanelly Corporation	8	8	0
Llanelly R.D.C.	8	8	0
Llantrissant & Llantwit Fardre R.D.C. (2)	16	16	0
Magor & St. Mellons R.D.C.	6	6	0
Merthyr Tydfil Corporation	10	10	0
Monmouthshire County Council	37	16	0
Mountain Ash U.D.C.	8	8	0
Mynyddislwyn U.D.C.	6	6	0
Neath Corporation	8	8	0
Newport Corporation	26	5	0
Penarth U.D.C.	6	6	0
Pontypool U.D.C.	8	8	0
Pontypridd U.D.C.	8	8	0
Port Talbot Corporation	8	8	0
Rhondda Corporation	26	5	0
Silburn, Mrs. E.	1	1	0
South Wales Electricity Board	33	0	0
Steel Company of Wales Ltd.	50	0	0
Swansea Corporation	26	5	0
Swansea Port Health Authority	15	15	0
Tredegar U.D.C.	6	6	0
Wales Coke Distributors' Association	15	15	0
Wales Gas Board	26	5	0
Ystradgynlais R.D.C.	6	6	0

Overseas Subscriptions

	£	s.	d.
Anderson, Dr. D. M. (U.S.A.)		17	11
Benline, Commissioner A. J. (U.S.A.) (2)	2	2	0
Bezares, F. (Spain)	1	1	0
Brunelle, Mrs. M. F. (U.S.A.)	1	15	0
Buschmann, C. H. (Netherlands)	1	1	0
Chamberlin, R. L. (U.S.A.)	1	13	1
Coucke, E. J. (Belgium)	1	1	0
Danson, J. (S. Rhodesia)	1	1	0
Dantin Gallego, Dr. J. (Spain)	1	1	0
De Permentier, P. R. (Belgium)	1	1	0
Durban Corporation (S. Africa)	50	8	0
Elex, S. A. (Switzerland)	3	0	0
English, Dr. B. V. (U.S.A.) (2)	3	9	5
Feige, H. J. (Israel)	2	0	0
First, Professor M. W. (U.S.A.)	3	9	2
Geleen, Municipality of (Netherlands)	8	6	0
Gerhardsson, G. (Sweden)	1	1	0
Grafe, Dr. K. (Germany)	1	1	0
Hooton, K. A. H. (U.S.A.)	1	5	0
Hunigen, Dr. Ing. E. (Germany)	1	1	0
Johannesburg Corpn. (S. Africa)	20	0	0
Johnson, K. R. (S. Africa)	2	0	6
Jones, E. H. (S. Africa)	1	1	0
Kettner, Dr. H. (Germany)	1	1	0
Kingston, W. (Eire)	1	1	0
Leichhardt, Municipality of (Australia)	10	10	0
*Madelin, Sqn. Ldr. I. (Akrotiri)		15	0
Mueller, Dr. P. K. (U.S.A.)	1	0	0
National Physical Research Laboratory (S. Africa)	5	5	0
Newcastle Corpn. (Australia)	2	2	0
Ottolenghi, A. (Italy)	1	1	0
Pedrero, Dr. P. S. (Spain)	1	2	0
Reif, Dr. A. E.	1	1	0
*Reifferscheid, Dr. H. (Germany)	1	1	0
Roberts, L. M. (U.S.A.)	1	13	9
Sordelli, Dr. D. (Italy)	1	1	0
Summers, P. A. (Canada)	2	0	0
Triffett, A. C. (Australia)	2	0	0
Vereeniging Corpn. (S. Africa)	1	1	0
Wight, Dr. J. Earle (Canada)		15	9
Subscriptions and donations under 5/-		2	6
	£14,594	17	4

CLEAN POWER

To the Central Electricity Generating Board, smoke means more than impure air. It means unburnt carbon, wasted power.

The Generating Board are, therefore, doing all they can to keep the air clean by applying the most advanced techniques as they are discovered by continuous research.

At modern power stations costing £50,000,000, over £3,500,000 is spent solely on clean air measures—tall chimneys and plant for extracting dust.

The gases themselves are dispersed harmlessly high into the upper atmosphere by forcing them up tall chimney stacks.

TRADE DIRECTORY AND BUYERS' GUIDE

AIR CONDITIONING EQUIPMENT

Airwick Ltd., 11 Stoke Poges Lane, Slough, Buckinghamshire (Slough 22322). ("*Airwick*" *Odour Counteractant Liquids and Equipment.*)

Bass, John, Ltd., Fleming Way, Crawley, Sussex (Crawley 27865). ("*Bassaire.*")

Carrier Engineering Co. Ltd., Carrier House, Warwick Road, London, S.W.1 (VICtoria 6858).

Davidson & Co. Ltd., Sirocco Engineering Works, Belfast, N. Ireland (Belfast 57251). ("*Sirocco.*")

Luwa (UK) Ltd., 36/41 High Street, South Norwood, London, S.E.25 (LIVingstone 6515).

Marshall & Parsons Ltd., 1111 London Road, Leigh-on-Sea, Essex (Southend 74867). ("*Draught Master*" *and* "*Flue Master.*")

Matthews & Yates Ltd., Cyclone Works, Swinton, Manchester (STD061 Swinton 2273). ("*Cyclone.*")

Heat & Air Systems Ltd., 155 Clarence Street, Kingston-upon-Thames (Kingston 2441).
Tiviotdale Chambers, Lancashire Hill, Stockport, Cheshire (Stockport 4679). ("*Dustfoil*" *Dust Collectors.*)

Norris Warming Co. Ltd., Burley House, 5/11 Theobalds Road, London, W.C.1 (HOLborn 7833).
2/3 Melrose Avenue, Clifton 8, Bristol (Bristol 30261).
Norris House, 611 Stretford Road, Manchester 16 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 28037).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

Powell Duffryn Engineering Co. Ltd., (Woodbank Division), Woodbank Works, Turncroft Lane, Stockport, Cheshire (Stockport 3441).
93/96 High Street, Uxbridge, Middlesex (Uxbridge 35634). ("*Sly Dynaclone*" *Dust Filters,* "*Dynaflow*" *Fans,* "*Impinjet*" *Scrubbers,* "*Carlyle*" *Air Conditioning.*)

Spencer & Halstead Ltd., Bridge Works, Ossett, Yorks. (Ossett 821).

W.H.S. (Pathfinder) Ltd., Brockhampton Lane, Havant, Hampshire (Havant 3661). ("*Pathfinder*" *Critical Atmosphere Control Equipment.*)

AIR DIFFUSERS

Norris Warming Co. Ltd., Burley House, 5/11 Theobalds Road, London, W.C.1 (HOLborn 7833).
62/63 Lionel Street, Birmingham 3 (Central 0981).
2/3 Melrose Avenue, Clifton 8, Bristol (Bristol 30261/5).
611 Stretford Road, Manchester 16 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 28037).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).
38/40 Elm Grove, Portsmouth (Portsmouth 25551/2).
5/6 Claremont Terrace, Glasgow, C.3 (Douglas 5901/2).

AIR FILTER MATERIALS

Bondina (Sales) Ltd., Greetland, Halifax, Yorkshire (Elland 3528). (*Bondina Rollabond Air Filter Products.*)

AIR POLLUTION MEASUREMENT

Austen Pumps Charles Ltd., Petersham Works, 100 Royston Road, Byfleet, Surrey (Byfleet 43224). ("*Dymax*" *Small Oil free diaphragm pumps.*)

C. F. Casella & Co. Ltd., Regent House Britannia Walk, London, N.1. (CLErken, well 8581/7). (*Airborne Particle Samplers.*) -

Fleming Instruments, Caxton Way, Stevenage, Hertfordshire (Stevenage 3101/5).

Glass Developments Ltd., Sudbourne Road, Brixton, London, S.W.2 (BRIxton 4041).

Visco Ltd., Stafford Road, Croydon, Surrey (MUNicipal 3861/9).

AIR PURIFIERS

Machine Control Ltd., Blatchford Road, Horsham, Sussex (Horsham 3215).
Old Road, Southam, Nr. Leamington Spa, Warwick (Southam 419 and 623).
104 West George Street, Glasgow, C.2 (Douglas 4376).

AIR STERILIZATION

W.H.S. (Pathfinder) Ltd., Brockhampton Road, Havant, Hampshire (Havant 3661). ("*Pathfinder*" *Critical Atmosphere Control Equipment.*)

AUTOMATIC CONTROL EQUIPMENT

John Bass Ltd., Crawley Works, Fleming Way, Crawley, Sussex (Crawley 28765). ("*Bassaire*" *clean air equipment.*)

Photoelectronics (Arcall) Ltd., 92 Oldfield Road, Sutton, Surrey (Fairlands 4571). ("*M.O.M.*")

BOILERS, DOMESTIC

Thomas Potterton Ltd., 20/30 Buckhold Road, London, S.W.18 (VANdyke 7202). (*Central Heating Equipment.*)

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).

Radiation Central Heating Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (WILlesden 1234). ("*Heatmaster*" *Gas Small Bore Central Heating Units.*)

BOILERS, INDUSTRIAL

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321).
Rutland House, 148 Edmond Street, Birmingham, 3 (Central 6131).
54 West Nile Street, Glasgow, C.1 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 8326).
Norfolk House, Grey Street, Newcastle upon Tyne, 1 (Newcastle upon Tyne 29212).
Aylward House, Wine Street, Bristol, 1 (C 294561).

T. G. Binner (Boilers) Ltd., New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

Cradley Boiler Co. Ltd., Cradley Heath, Staffordshire (Cradley Heath 66003/5).

Cochran & Co. (Annan) Ltd., Annan, Dumfriesshire, Scotland (Annan 2111).
Leslie Court, 22/23 Strutton Ground, Westminster, London, S.W.1 (ABBey 4441).

Edwin Danks & Co. (Oldbury) Ltd., P.O. Box No. 4, Oldbury, Birmingham (Broadwell 2531).

Marshall Sons & Co. Ltd., Britannia Works, Gainsborough, Lincolnshire (Gainsborough 2301). (*Marshall automatic boilers.*)

Thomas Potterton Ltd., 20/30 Buckhold Road, London, S.W.18 (VANdyke 7202). (*Central heating equipment.*)

J. Stone & Co. (Deptford) Ltd., Stone Vapor Boiler Division, Arklow Road, London, S.E.14 (TIDeway 1202).
51 Summer Row, Birmingham, 3 (Central 9385).
Bleasby Street, Oldham (Main 5421).
Bulldale Street, Yoker, Glasgow, W4. (Scotstoun 3401).

BOILERS, INDUSTRIAL (SOLID FUEL)

Cradley Boiler Co. Ltd., Cradley Heath, Staffordshire (Cradley Heath 66003/5).

Edwin Danks & Co. (Oldbury) Ltd., P.O. Box No. 4, Oldbury, Birmingham (Broadwell 2431).

Vauxhall Boiler Co. Ltd., Banbury, Oxfordshire (Banbury 3437). ("*Ambassador,*" "*Bouellat*" *and series flow boilers.*)

BOILERS, PACKAGED (OIL FIRED)

Auto Combustions (London) Ltd., 360/364 Wandsworth Road, London, S.W.8 (MACaulay 9121) (4 lines). ("*Swirlamiser Vapormiser Autoflame*".)

Cochran & Co. (Annan) Ltd., Annan, Dumfriesshire, Scotland (Annan 2111).
Lesley Court, 22/23 Strutton Ground, Westminster, London, S.W.1 (ABBey 4441).

Cradley Boiler Co. Ltd., Cradley Heath, Staffordshire (Cradley Heath 66003/5).

Edwin Danks & Co. (Oldbury) Ltd., P.O. Box No. 4, Oldbury, Birmingham (Broadwell 2531).

Foster Wheeler Ltd., Foster Wheeler House, Chapel Street, London, N.W.1 (PADdington 1221).

Steam Division, 3 Ixworth Place, Chelsea, London, S.W.3 (KENsington 6363).

J. Stone & Co. (Deptford) Ltd., Stone Vapor Boiler Division, Arklow Road, London, S.E.14 (TIDeway 1202).
51 Summer Road, Birmingham, 3 (Central 9358).
Bleasby Street, Oldham (Main 5421).
Bulldale Street, Yoker, Glasgow, W.4 (Scotstoun 3401).

Vauxhall Boiler Co. Ltd., Banbury, Oxfordshire. (Banbury 3437). ("*Ambassador,*" "*Bouellat*" *and series flow boilers.*)

BOILERS, PACKAGED (GAS FIRED)

J. Stone & Co. (Deptford) Ltd., Stone Vapor Boiler Division, Arklow Road, London, S.E.14 (TIDeway 1202).
51 Summer Road, Birmingham, 3 (Central 9385).
Bleasby Street, Oldham (Main 5421).
Bulldale Street, Yoker, Glasgow, W.4 (Scotstoun 3401).

BRICKWORK BOILER SETTING

The Chimney Construction Co. Ltd., Hagley Road, Stourbridge, Worcestershire (Stourbridge 5623).

Topping & Leggat, 13 Old Park Road, London, N.13 (PALmers Green 3268).

BRICK AND PRECAST CONCRETE CHIMNEYS AND BOILER SETTING BRICKWORK

The Chimney Construction Co. Ltd., Hagley Road, Stourbridge, Worcestershire (Stourbridge 5623).

BURNERS, GAS

Auto Combustions (London) Ltd., 360/364 Wandsworth Road, London, S.W.8 (MACaulay 9121, (4 lines). ("*Swirlamiser Vapormiser Autoflame*".)

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321).
Rutland House, 140 Edmond Street, Birmingham, 3 (Central 6131).
54 West Nile Street, Glasgow, C.1 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 8326).
Norfolk House, Grey Street, Newcastle upon Tyne, 1 (Newcastle upon Tyne 29212).

Hamworthy Engineering Ltd., Combustion Division, Poole, Dorset (Poole 5123) (25 lines). (*Oil and gas burners, etc.*)

Hope's Heating and Engineering Ltd., Halford Works, Smethwick, Birmingham, 4 (Smethwick 2191).
16 Berners Street, London, W.1 (MUSeum 8412).
8 Cumberland Road, Leeds, 6 (Leeds 59331).
Splott Works, Walker Road, Cardiff (Cardiff 23581/2).
7 Pier Street, Hull (Hull Central 35346).

Schieldrop & Co. Ltd., High Street, Stotfold, Hitchin, Herts. (Stotfold 414). (*Gas and Oil Burner Manufacturers.*)

BURNERS, OIL

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321).
Rutland House, 140 Edmond Street, Birmingham, 3 (Central 6131).
54 West Nile Street, Glasgow, C.1 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 8326).
Norfolk House, Grey Street, Newcastle upon Tyne, 1 (Newcastle upon Tyne 29212).

Edwin Danks & Co. (Oldbury) Ltd., P.O. Box No. 4, Oldbury, Birmingham (Broadwell 2531).

Hamworthy Engineering Ltd., Combustion Division, Poole, Dorset (Poole 5123) (25 lines).

Hope's Heating & Engineering Ltd., Halford Works, Smethwick, Birmingham, 4 (Smethwick 2191).
16 Berners Street, London, W.1 (MUSeum 8412).
8 Cumberland Road, Leeds, 5 (Leeds 59331).
Splott Works, Walker Road, Cardiff (Cardiff 23581/2).
7 Pier Street, Hull (Hull Central 35346).

Riley (IC) Products Ltd., 19 Woburn Place, London, W.C.1 (TERminus 2622).

Schieldrop & Co. Ltd., High Street, Stotfold, Hitchin, Hertfordshire (Stotfold 414). (*Gas and Oil Burner Manufacturers.*)

BURNERS, OIL INDUSTRIAL

John I. Thornycroft & Co. Ltd., Woolston Works, Southampton, Hampshire (Southampton 48214).

BURNERS, SOLID FUEL

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321).
Rutland House, 140 Edmond Street, Birmingham, 3 (Central 6131).
54 West Nile Street, Glasgow, C.1 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 8326).
Norfolk House, Grey Street, Newcastle upon Tyne, 1 (Newcastle upon Tyne 29212).

James Proctor Ltd., P.O. Box 19, Hammerton Street, Burnley (Burnley 21021). (*Mechanical Stokers and Coal Handling.*)

Riley (IC) Products Ltd., 19 Woburn Place, London, W.C.1 (TERminus 2622).

CEILINGS, HEATED

Norris Warming Co. Ltd., Burley House, 5/11 Theobalds Road, London, W.C.1 (HOLborn 7833).
2/3 Melrose Avenue, Clifton, 8, Bristol (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 16 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 28037).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

Richard James (Westminster) Ltd., Ferry Works, Lacy Road, Putney, London, S.W.15 (PUTney 7792).

CATALYTIC COMBUSTION EQUIPMENT

Kavag, 6461 Gondsroth/Bei Frankfurt, W. Germany (06055-515).
G.B. Office, Somerset House, Georges Street, Halifax (Halifax 65109).

CENTRAL HEATING SYSTEMS

W. G. Cannon & Sons Ltd., Carolyn House, Dingwall Road, Croydon, Surrey (Croydon 2201).
24 The Grove, Gosforth, Newcastle upon Tyne, 3 (Gosforth 53847). (*Heating and Ventilating Contractors.*)

Dimplex Ltd., Millbrook Trading Estate, Millbrook, Southampton, Hampshire (Southampton 74425). (*Electric Heaters.*)

Jones & Campbell Ltd., P.O. Box No. 36, Torwood Foundry, Larbert, Stirlingshire (Larbert 2114, 3 lines). ("*Tor,*" "*Torglow,*" *and* "*Torwood.*")

Norris Warming Co. Ltd., Burley House, 5/11 Theobald's Road, London, W.C.1 (HOLborn 7833).
2/3 Melrose Avenue, Clifton, 8 (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 16 (Trafford Park 3454).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).

Radiation Central Heating Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (WILlesden 1234).

Radiation Parkray Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (WILlesden 1234).

Richard James (Westminster) Ltd., Ferry House, Lacy Road, Putney, London, S.W.15 (PUTney 7792).

CENTRAL OIL DISTRIBUTION SYSTEMS

E. G. Reeve & Sons Ltd., Burton Road, St. Faith's Industrial Estate, Norwich, Norfolk (NOR 84 Norwich 47228).

Shell Mex & B.P. Ltd., Shell Mex House, Strand, London, W.C.2 (TEMple Bar 1234).

CHIMNEYS

F. E. Beaumont Ltd., 462/480 Rathgar Road, Brixton, London, S.W.9 (BRIxton 4066). Telex 25837.
Midlands Office, 28 Birmingham Street, Oldbury, Broadwell (Broadwell 3938). Telex 338146. ("*Beauvent*"/"*Beauval.*")

The Constructional Engineering Co. Ltd., Titan Works, Charles Henry Street, Birmingham 12 (Midland 4753-4). ("*Titan,*" "*Titan-Zschocke,*" "*Titan-D.B.*")

Combustion Equipment Ltd., 322 St. John's Street, London, E.C.1 (BRUnswick 7785). (*Cory grit arresters, aluminium cladding for chimneys, Dribore chimneys, furnace baffle for shell boilers, waste material disposal furnaces.*)

Edwin Danks & Co. Ltd. (Oldbury) Ltd., P.O. Box No. 4, Oldbury, Birmingham (Broadwell 2531).

E. G. Reeve & Sons Ltd., Burton Road, St. Faith's Industrial Estate, Norwich, Norfolk (NOR 84 N) (Norwich 47228).

Rodway & Taylor (Birmingham) Ltd., 85/90 Buckingham Street, Birmingham, 19 (Central 4027-8).

Steel Chimneys Ltd., P.O. Box No. 1, New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

Tipton Tub & Tube Co. Ltd., Bloomfield Road, Tipton, Staffordshire (Tipton 1011 and 3418). ("*Centriflovane*" *Grit Arresters.*)
Topping & Leggat, 13 Old Park Road, London, N.13 (PALmers Green 3268).

CHIMNEY CLADDING (ALUMINIUM)

F. E. Beaumont Ltd., 462/480 Rathgar Road, Brixton, London, S.W.9 (BRIxton 4066). Telex 25837.
Midlands Office, 28 Birmingham Street, Oldbury, Broadwell (Broadwell 2939). Telex 338146. ("*Beauvent,*" "*Beauval.*")

Combustion Equipment Ltd., 322 St. John Street, London, E.C.1 (BRUnswick 7785). (*Cory grit arrester, Dribore chimneys, furnace baffle for shell boilers, waste material disposal furnaces.*)

Rodway & Taylor (Birmingham) Ltd., 85/90 Buckingham Street, Birmingham, 19 (Central 4027/8).

Steel Chimneys Ltd., P.O. Box No. 1, New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

CLEAN ROOMS

Air Movement Ltd., Dover Road, Northfleet, Kent (Gravesend 64844). ("*Amaire.*")

John Bass Ltd., Fleming Way, Crawley, Sussex (Crawley 27865). ("*Bassaire.*")

Constant Air Systems, Raeburn House, Northolt Road, Harrow, Middlesex (CONcord 0288).
Wolverley House, Digbeth, Birmingham, 5 (MIDland 5148).

Norris Warming Co. Ltd., Burley House, 5/11 Theobalds Road, London, W.C.1 (HOLborn 7833).
62/63 Lionel Street, Birmingham, 3 (Central 0981).
2/3 Melrose Avenue, Clifton, 8 (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester 16 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 28037).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).
38/40 Elm Grove, Portsmouth (Portsmouth 25551/2).
5/6 Claremont Terrace, Glasgow, C.3 (Douglas 5901/2).

CLEAN AIR SUPPLY UNITS

Machine Control Ltd., Blatchford Road, Horsham, Sussex (Horsham 3215).
Old Road, Southam, Nr. Leamington Spa, Warwick. (Southam 419 and 623).
104 West George Street, Glasgow, C.2 (Douglas 4376).

CLOTH FILTER TYPE DUST ARRESTERS

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (KINgston 7799). ("*Tubix*" *Centrifugal Collectors, Airmix*" *Wet Collectors.*)

COAL HANDLING PLANT

Buell Ltd., 8/10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761). ('*Buell/Van Tongeren*" *Dust Collection and Powder Classification Plants.* "*Buell/Buttner*" *Industrial Drying and Cooling Plants.*)

Edwin Danks & Co. (Oldbury) Ltd., P.O. Box No. 4, Oldbury, Birmingham (Broadwell 2531).

James Proctor Ltd., P.O. Box No. 19, Hammerton Street, Burnley, Lancs. (Burnley 21021). (*Mechanical Stokers and Coal Handling.*)

John Thompson (Triumph) Ltd., Triumph Works, Kirkstall Road, Leeds, 3 (Leeds 34841). ("*Triumph*" *Stokers.*)

COMBUSTION TESTING EQUIPMENT

Shandon Scientific Co. Ltd., 65 Pound Lane, London, N.W.10 (WILlesden 8671).("*Fyrite*" *CO_2 indicator*, "*True Spot*" *smoke tester*, "*MZF*" *draft gauge*, "*Bacharach*" *combustion testing equipment.*)

CONTRACTORS : HEATING, VENTILATING AND AIR CONDITIONING

Adams & Adams Ltd., Heating and Ventilating Engineers, 4 Carlton Crescent, Southampton (Southampton 22602).

John Bass Ltd., Crawley Works, Fleming Way, Crawley, Surrey (Crawley 28765). ("*Bassaire.*")

Borsari & Co., Zollikon-Zurich, Switzerland (24 96 18). (*Tile lined underground fuel oil storage tanks of reinforced concrete.*)

W. G. Cannon & Sons Ltd., Carolyn House, Dingwall Road, Croydon, Surrey (CROydon 2201).
24 The Grove, Gosforth, Newcastle upon Tyne, 3 (Gosforth 53847). (*Heating and Ventilating Contractors.*)

Carrier Engineering Co. Ltd., Carrier House, Warwick Row, London, S.W.1 (VICtoria 6858). ("*Carrier Drysys.*")

Constant Air Systems, Raebarn House, Northolt Road, Harrow, Middlesex (CONcord 0288).
Wolverley House, Digbeth, Birmingham, 5 (Midland 5148).

Duscon Engineering Ltd., P.O. Box 8, Union Works, Union Lane, Droitwich, Worcestershire.

Fan Application and Engineering Ltd., 76 Rivington Street, London, E.C.2 (SHOreditch 6288).

Alfred Grindrod & Co. Ltd., 122 Charles Street, Sheffield, 1 (Sheffield 27591).

Heat & Air Systems Ltd., 155 Clarence Street, Kingston upon Thames (Kingston 2446).
Tiviotdale Chambers, Lancashire Hill, Stockport, Cheshire (Stockport 4679).

DUSTFOIL DUST COLLECTORS

Hope's Heating & Engineering Ltd., Halford Works, Smethwick, Birmingham, 40 (Smethwick 2191).
16 Berners Street, London, W.1 (MUSeum 8412).
8 Cumberland Road, Leeds, 3 (Leeds 59331).
Splott Works, Walker Road, Cardiff (Cardiff 23581-2).
7 Pier Street, Hull (Hull Central 35346).

Morgan Air Treatments Ltd., 55/57 Salop Street, Birmingham, 12 (VIC 2096).

Norris Warming Co. Ltd., Burley House 5/11 Theobalds Road, London, W.C.1 (HOLborn 7833).
2/3 Melrose Avenue, Clifton, 8 (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 15 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 28037).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

Richard James (Westminster) Ltd., Ferry House, Lacy Road, Putney, London, S.W.15 (PUTney 7792).

W.H.S. (Pathfinder) Ltd., Brockhampton Lane, Havant, Hampshire (Havant 3661). ("*Pathfinder*" *Critical Atmosphere Control Equipment.*)

Rodway & Taylor (Birmingham) Ltd., 85/90 Buckingham Street, Birmingham, 19 (Central 4027-8).

CONVECTORS

Dimplex Ltd., Millbrook, Southampton, Hampshire (Southampton 74425/9). (*Electric Heaters.*)

Charles Lathe & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffordshire (Tipton 1887). ("*Claco*" *solid fuel burning appliances.*)

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

Radiation Parkray Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

COOLERS

Buell Ltd., 8/10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761). ("*Buell/Van Tongeren*" *Dust Collecting and Power Classification Plant,* "*Buell/Buttner*" *Industrial Drying and Cooling Plants.*)

Constructional Engineering Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (Midland 4753/4). ("*Titan,*" "*Titan Zschocke,*" "*Titan DB.*")

Heenan & Froude Ltd., Shrub Hill, Worcester (Worcester 23461).

Visco Ltd., Stafford Road, Croydon, Surrey (MUNicipal 3861/9).

DAMPERS

Combustion Equipment Ltd., 322 St. John Street, London, E.C.1 (BRUnswick 7785). (*Cory grit arresters aluminium cladding for chimneys, Dribore chimneys furnace baffle for shell boilers, waste material disposal furnaces,* "*Airlock*" *sealing dampers.*)

DEHUMIDIFIERS

Heather Filters Ltd., 7 Kendall Place, Baker Street, London, W.1 (HUNter 1801). ("*Humexair.*")

DISCHARGE VALVES

Buell Ltd., 8/10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761). ("*Buell/Van Tongeren*" *Dust Collection and Powder Classification Plants*, "*Buell/Buttner*" *Industrial Drying and Cooling Plants.*)

Collectron Ltd., 29 Windsor Street, Cheltenham, Gloucestershire (Cheltenham 21195/8). ("*Collectron.*")

Nailsea Engineering Co. Ltd., Samlesbury Airfield, Nr. Blackburn, Lancashire (Mellor 666). Telex 63146. (*Reverse Jet Filters*, "*Pnu-Jet.*")

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (KINgston 7799). ("*Tubix*" *Centrifugal Collectors* "*Airmix*" *Wet Collectors.*)

DRAUGHT CONTROLLERS

Metropolitan Engineering Co. Ltd., 14 Earl Cottages, Earl Road, London, S.E.1 (BERmondsey 4331). (*Metro Flex Gaslight Isolators.*)

DUCT HEATERS

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).

Geoffrey Woods Ltd., Pear Tree Road, Stanway, Colchester, Essex (Colchester 5131). Telex 18231.

DUCTING

W. G. Cannon & Sons Ltd., Carolyn House, Dingwall Road, Croydon, Surrey (CROydon 2201).

24 The Grove, Gosforth, Newcastle upon Tyne, 3 (Gosforth 53847). (*Heating and Ventilating Contractors.*)

The Constructional Engineering Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (Midland 4753/4). ("*Titan*," "*Titan Zschocke*," "*Titan DB.*")

Henderson Safety Tank Co. Ltd., Croydon Airport, Croydon, Surrey (CROydon 7777).

Radiation Central Heating Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234). ("*Ductair*" *Gas Warm Air Central Heating Units.*)

Rodway & Taylor (Birmingham) Ltd., 85/90 Buckingham Street, Birmingham, 19 (Central 4027/8).

Tipton Tub & Tube Co. Ltd., Bloomfield, Tipton, Staffordshire (Tipton 1011 and 3418). ("*Centriflovane*" *Grit Arresters.*)

W.H.S. (Pathfinder) Ltd., Brockhampton Lane, Havant, Hampshire (Havant 3661). ("*Pathfinder*" *Critical Atmosphere Control Equipment.*)

DUCT LINING SOUND ABSORBENT WITH LOW FIRE PROPAGATION

Declon Foam Plastics Ltd., Cranbourne Estate, Potters Bar, Herts. (Potters Bar 57151). ("*Acoustifoam.*")

DUST CLASSIFICATION PLANT

Buell Ltd., 8/10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761). ("*Buell/Van Tongeren*" *Dust Collection and Powder Classification Plants*, "*Buell/Buttner*" *Industrial Drying and Cooling Plants.*)

Collectron Ltd., 29 Windsor Street, Cheltenham, Gloucestershire (Cheltenham 21295/8). ("*Collectron.*")

DUST COLLECTION EQUIPMENT AND PLANT

Augusts Ltd., Halifax (Halifax 61245/6/7/8).

Alldays & Onions Ltd., P.O. Box 254, Great Western Works, Sydenham Road, Birmingham, 11 (VICtoria 2551/4).

Ambuco Ltd., 49 Moorgate, London, E.C.2 (METropolitan 9242/4).

B.V.C. Engineering Ltd., Leatherhead, Surrey (Ashtead 6121). ("*B.V.C.*")

Dron & Dickson Ltd., 158 Bath Street, Glasgow, C.2 (Douglas 1337). (*Ambuco Cyclones scrubbers and fabric arrester.*)

British Ceca Co. Ltd., 175 Piccadilly, London, W.1 (HYDe Park 5131). ("*Ceca-filter,*" *Reverse Jet Filters.*)

Keith Blackman Ltd., Mill Mead Road, Tottenham, London, N.17 (TOTtenham 4522). ("*Tornado.*")

Buell Ltd., 8/10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761). ("*Buell-Van Tongeren*" *Dust Collection and Powder Classification Plants,* "*Buell Buttner*" *Industrial Drying and Cooling Plants.*)

The Constructional Engineering Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (MIDland 4753). ("*Titan,*" "*Titan Zschocke,*" "*Titan-DB.*")

Collectron Ltd., 29 Windsor Street, Cheltenham, Gloucestershire (Cheltenham 21295). ("*Collectron.*")

Fan Application & Engineering Ltd., 76 Rivington Street, London, E.C.2 (SHOreditch 6288).

Centri Spray Ltd., Green Dragon House, 64/70 High Street, Croydon, Surrey (Croydon 7431).

Centri Spray, G.m.b.H., 10 neue Weyerstrasse, Cologne, Germany (tel.: 23 59 28).

Centri Spray Sarl., 88 Ave, Victor Hugo, Paris, France (tel.: 704 3066). (*Centri Spray Air Washers.*)

Constant Air Systems Ltd., Raebarn House, Northolt Road, Harrow, Middlesex (CONcord 0288).
Wolverley House, Digbeth, Birmingham, 5. (Midland 5148).

Chemical Construction (GB) Ltd., Regal House, Twickenham, Middlesex (Hope's Grove 4455). ("*Chemico*" *Pease Anthony Venturi Scrubbers.*)

Combustion Equipment Ltd., 322 St. John Street, London, E.C.1 (BRUnswick 7785). (*Cory grit arresters, aluminium cladding for chimneys, furnace baffle for shell boilers, waste material disposal furnaces,* "*Airlok*" *sealing dampers.*)

Drummond Dust & Fume Extractors Ltd., Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (LARkswood 4441/2).

Dust Control Equipment Ltd., Thurmaston, Leicestershire (Syston 3333). (*Dust Control Units, wet de-dusters, semi and fully automatic fabric filters, cyclone installations.*)

Fan Systems Ltd., 2 Brazil Street, Manchester, 1 (Central 7156). (*Fan Installations.*)

Fan Application & Engineering Ltd., 76 Rivington Street, London, E.C.2 (SHOreditch 6288).

James Howden & Co. Ltd., 195 Scotland Street, Glasgow, C.5 (South 2131).
15 Grosvenor Place, London, S.W.1 (BELgravia 1301).

Duscon Engineering Co. Ltd., P.O. Box 8, Union Works, Union Lane, Droitwich, Worcs. (Droitwich 2027/8).

Heat & Air Systems Ltd., 155 Clarence Street, Kingston upon Thames (Kingston 2441).
Tiviotdale Chambers, Lancashire Hill, Stockport, Cheshire (Stockport 4679). (*Dust Foil Dust Collectors.*)

Head Wrightson & Co. Ltd., Teesdale Iron Works, G.P.O. Box 10, Thornaby on Tees, Stockton on Tees, Co. Durham (Stockton 62241).

Morgan Air Treatments Ltd., 55/57 Salop Street, Birmingham, 12 (Vic. 2096).

Nailsea Engineering Co. Ltd., Samlesbury Air Field, Nr. Blackburn, Lancashire (Mellor 666). ("*Pnu-Jet*" *reverse jet filters.*)

Powell Duffryn Engineering Co. Ltd., (Woodbank Division), Woodbank Works, Turncroft Lane, Stockport, Cheshire (Stockport 3441).
93/96 High Street, Uxbridge, Middlesex (Uxbridge 35634/8). ("*Impinjet,*" "*Sly Dynaclon*" *Dust Filters, Scrubbers,* "*Carlyle*" *Air Conditioning.*)

R. J. Richardson & Sons Ltd., Engineering & Shotglass Works, 37 Commercial Street, Birmingham, 1 (Midland 2281 (P.B.X.).

Rodway & Taylor (Birmingham) Ltd., 85/90 Buckingham Street, Birmingham, 19(Central 4027/8).

Spencer & Halstead Ltd., Ossett, Yorkshire (Ossett 821).

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (KINgston 7799). (*"Tubix" Centrifugal Collectors, "Airmix" Wet Collectors.*)

Tilghmans Ltd., Broadheath, Altrincham, Cheshire (Altrincham 4242) (9 lines).

Visco Ltd, Stafford Road, Croydon, Surrey. (MUNicipal 3861/9).

Western Precipitation Division Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711). (*"Joy" microdyne scrubbers and turbulaire scrubbers.*)

DUST SAMPLING EQUIPMENT

Airflow Developments Ltd., Lancaster Road, High Wycombe, Buckinghamshire (High Wycombe 25252).

Casella, C F. & Co. Ltd., Regent House, Britannia Walk, London, N.1 (CLErkenwell 8581). (*Airborne Particle Samplers.*)

Fleming Instruments Ltd., Caxton Way, Stevenage, Hertfordshire (Stevenage 3101/5).

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (KINgston 7799). (*"Tubix" centrifugal collectors, "Airmix" wet collectors.*)

ECONOMIZERS, FUEL

Combustion Equipment Ltd., 322 St. John Street, London, E.C.1 (BRUnswick 7785). (*Cory grit arresters, aluminium cladding for chimneys, Dribore chimneys furnace baffle for shell boilers, waste material disposal furnaces.*)

R. M. Catterson Smith Ltd., Adams Bridge Exhibition Grounds, Wembley, Middlesex (WEMbley 4291).

Dimplex Ltd., Millbrook Trading Estate, Millbrook, Southampton, Hampshire (Southampton 74425). (*Electric Heaters.*)

H. Frost & Co. Ltd., Sunhouse Works, New Street, Walsall, Staffordshire (Walsall 25551). (*"Sunhouse" Electric Heaters.*)

Isopad Ltd., Barnet By Pass, Boreham Wood, Hertfordshire (ELStree 2817). (*Electric Heating Tapes and Mantles.*)

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).

Geoffrey Woods Ltd., Pear Tree Road, Stanway, Colchester, Essex (Colchester 5131). Telex 18231.

ELECTRIC UNIT STORAGE HEATERS

Dimplex Ltd., Millbrook Trading Estate, Millbrook Southampton, Hampshire (Southampton 74425). (*Electric Heaters.*)

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).

ELECTRICAL PRECIPITATORS

The Constructional Engineering Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (Midland 4753/4). (*"Titan," "Titan-Zschocke," "Titan-DB."*)

Collectron Ltd., 29 Windsor Street, Cheltenham, Gloucestershire (Cheltenham 21195/8). (*"Collectron."*)

ELECTRICAL PRECIPITATORS MAINTENANCE

James Howden & Co. Ltd., 195 Scotland Street, Glasgow, C.5 (South 2131).
15 Grosvenor Place, London, S.W.1 (BELgravia 1301).

Pionex Ltd., Werneth House, Stockport Road, Gee Cross, Hyde, Cheshire (Hyde 3969).

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233).

Visco Ltd, Stafford Road, Croydon, Surrey (MUNicipal 3861/9).

EXHIBITION AND DISPLAY CONTRACTORS

Central Display Co. Ltd., 47/49 Bendon Valley, Earlsfield, London, S.W.18 (VANdyke 8044/7). (*Exhibition Contractors, Display Producers and Printers.*)

Pricedale Electrical Co. Ltd., 205 Warwick Road, Kensington, London, W.14 (EMPire 8284/5).

FANS

Aerex Ltd., Cavendish Buildings, 220 West Street, Sheffield, 1 (Sheffield 28441).

London Office: 18 Buckingham Gate, London, S.W.1 (TATe Gallery 7292).

Northern Office: Barton Chambers, Off St. Ann's Square, Manchester, 2 (DEAnsgate 6477).

Midlands Office: Portland Buildings, Portland Place, Aldridge, Staffordshire (Aldridge 52173).

Southern Office: 5 London Road, Camberley, Surrey (Camberley 5228).

Alldays & Onions Ltd., P.O. Box 234, Great Western Works, Sydenham Road, Birmingham, 11 (Vic. 2551/4).

Chemical Trading Co. Ltd., 25 Berkeley Square, London, W.1 (GROsvenor 1246). ("*Fiberglas.*")

Davidson & Co. Ltd., Sirocco Engineering Works, Belfast, 5, Northern Ireland (Belfast 57251). ("**SIROCCO.**")

Fan Systems Ltd., 2 Brazil Street, Manchester, 1 (Central 7156). (*Fan Installations.*)

James Howden & Co. Ltd., 195 Scotland Street, Glasgow, C.5 (South 2131).
15 Grosvenor Place, London, S.W.1 (BELgravia 1301).

Matthews & Yates Ltd., Cyclone Works, Swinton, Manchester (STD 061 Swinton 2273).

Powell Duffryn Engineering Co. Ltd., (Woodbank Division), Woodbank Works, Turncroft Lane, Stockport, Cheshire (Stockport 3441).

93/96 High Street, Uxbridge, Middlesex (Uxbridge 35634/8). ("*Impinjet Sly Dynaclon*" *Dust Filters, Scrubbers,* "*Dynaflow*" *fans,* "*Carlyle*" *Air Conditioning.*)

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233).

Spencer & Halstead, Bridge Works, Ossett, Yorkshire (Ossett 821).

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (Kingston 7799). ("*Tubix*" *Centrifugal Collectors,* "*Armix*" *Wet Collectors.*)

FILTERS, AIR

Keith Blackman Ltd., Mill Mead Road, Tottenham, London, N.17 (TOTtenham 4522). ("*Tornado.*")

Centri Spray Ltd., Green Dragon House, 64/70 High Street, Croydon, Surrey (Croydon 7431).

Centri Spray, G.m.b.H., 10 neue Weyerstrasse, Cologne, Germany (tel.: 23 59 28).

Centri Spray Sarl., 88 Ave. Victor Hugo, Paris, France (tel.: 704 3066). (*Centri Spray Air Washers.*)

Davis Industrial Filters Ltd., Mead Works, Parsons Mead, Croydon, Surrey (Croydon 3873). (*Washable Plastic Filter.*)

Declon Foam Plastics Ltd., Cranborne Estate, Potters Bar, Hertfordshire (Potters Bar 57151). ("*Scottfoam*" *filters,* "*Acoustifoam*" *duct lining.*)

Delbag Airfilters Ltd , 15 Kensington High Street, London, W.8 (WEStern 5651). Cables: Delfilters London W.8.

Heather Filters Ltd., 7 Kendall Place, Baker Street, London, W.1 (HUNter 1801). (*Multi-Brush.*)

Luwa (UK) Ltd., 36/41 High Street, South Norwood, London, S.E.25 (LIVingstone 6515).

Machine Control Ltd., Blatchford Road, Horsham, Sussex (Horsham 3215).
Old Road, Southam, Nr. Leamington Spa, Warwickshire (Southam 419 and 623).
104 West George Street, Glasgow, C.2 (Douglas 4372). ("*Emcel*" *Air Filters*, "*Emcel*" *Air Purifiers*, "*Emcel*" *Clean Air Supply Units.*)

Matthews & Yates Ltd., Cyclone Works, Swinton, Manchester (STD 061 Swinton 2273). ("*Cyclone.*")

Nailsea Engineering Co. Ltd., Samlesbury Airfield, Blackburn (Mellor 666). Telex 63146. ("*Pnu-jets*" *reverse jet filters.*)

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233).

Tilghmans Ltd, Broadheath, Altrincham, Cheshire (Altrincham 4242, 9 lines).

Visco Ltd, Stafford Road, Croydon, Surrey (MUNicipal 3861/9).

Western Precipitation Division, Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711). ("*Joy*" *microdyne scrubbers and turbulair scrubbers, precipitators, mechanical dust collectors, bag filters.*)

FILTERS, AIR (WASHABLE)

Declon Foam Plastics Ltd., Cranborne Estate, Potters Bar, Herts. ("*Scott Foam*" *Filters.*)

FIRE LIGHTERS (ELECTRIC)

Best Products Ltd., Ranelagh House, Felixstowe, Suffolk (Felixstowe 3154/5/6). ("*Matchless*" *electric firelighter.*)

FLOOR HEATING

Richard James (Westminster) Ltd., Ferry Works, Lacy Road, Putney, London, S.W.15 (PUTney 7792).

FLUE ASH AND CLINKER CONVEYING PLANT

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321).
Rutland House, 140 Edmond Street, Birmingham, 3 (Central 6131).
54 West Nile Street, Glasgow, C.1 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 8326).
Norfolk House, Grey Street, Newcastle upon Tyne, 1 (Newcastle upon Tyne 29212).

B.V.C. Engineering Ltd., Leatherhead, Surrey (Ashtead 6121). ("*B.V.C.*")

James Proctor Ltd, P.O. Box 19, Hammerton Street, Burnley (Burnley 21021).

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 1233).

John Thompson (Triumph) Ltd., Triumph Works, Kirkstall Road, Leeds, 3 (Leeds 34841). ("*Triumph*" *Stokers.*)

FLUE DUST EXTRACTION PLANT

Keith Blackman Ltd., Mill Mead Road, Tottenham, London, N.17 (TOTtenham 4522). ("*Tornado.*")

Buell Ltd, 8/10 Minerva Road, North Acton, London, N.W.10 (ELG 1761). ("*Buell/Van Tongeren*" *Dust Collection Powder Classification Plants*, "*Buell/Buttner*" *Industrial Drying and Cooling Plants.*)

B.V.C. Engineering Ltd., Leatherhead Surrey (Ashtead 6121). ("*B.V.C.*")

The Constructional Engineering Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (Midland 4763/4). ("*Titan*," "*Titan-Zschocke*," "*Titan-DB.*")

Collectron Ltd., 29 Windsor Street, Cheltenham, Gloucestershire (Cheltenham 21195/8). ("*Collectron.*")

Centri Spray Ltd., Green Dragon House, 64/70 High Street, Croydon, Surrey (CROydon 7431)

Centri Spray G.m.b.H., 10 neue Weyerstrasse, Cologne, Germany (tel.: 23 59 28).

Centri Spray Sarl., 88 Ave. Victor Hugo, Paris, France (tel.: 704 3066). (*Centri Spray Air Washers.*)

Davidson & Co Ltd., Sirocco Engineering Works, Belfast, 5, Northern Ireland (Belfast 57251). ("*Sirocco.*")

Sturtevant Engineering Co Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233).

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (Kingston 7799). ("*Tubix*" *Centrifugal Collectors,* "*Airmix*" *Wet Collectors.*)

FLUE GAS DUST MONITORING DEVICE (C.E.G.N. TYPE)

Airflow Developments Ltd., Lancaster Road, High Wycombe, Bucks. (High Wycombe 5252).

Photoelectronics (Arcall) Ltd., 92 Oldfield Road, Sutton, Surrey (Fairlands 4971). ("*M.O.M.*")

FLUE GAS SAMPLING EQUIPMENT (B.C.U.R.A. TYPE)

Airflow Developments Ltd., Lancaster Road, High Wycombe, Bucks. (High Wycombe 5252).

FLUE GAS TREATMENT

D.C.P. Systems Ltd., Centre Heights, 137 Finchley Road, London, N.W.3 (JUNiper 1121).

FLUE HEATERS, BALANCED

F. A. Borchardt Ltd., Mill Lane, Old Swan, Liverpool, 13 (Stoneycroft 4757). ("*DRU-gasar*" *balanced flue gas heater.*)

FUEL EFFICIENCY ADVISORY SERVICE

National Industrial Fuel Efficiency Service, 71 Grosvenor Street, London, W.1 (HYDe Park 9706).

Solid Smokeless Fuels Federation, York House, Empire Way, Wembley, Middlesex.

FUELS—ELECTRICITY

Electricity Council EDA Division, Trafalgar Buildings, 1 Charing Cross, London, S.W.1 (WHItehall 6757). (*Electricity supply.*)

FUEL—GAS

Gas Council, 4/5 Gresvenor Place, London, S.W.1 (BELgravia 4321).

Scottish Gas Board, 26 Drumsheugh Gardens, Edinburgh, 3 (Caledonian 2052/7).

Northern Gas Board, P.O. Box 1 G.B., Newcastle upon Tyne (Newcastle upon Tyne 663322).

North Western Gas Board, Whelman House, Altrincham, Cheshire (Altrincham 6311).

North Eastern Gas Board, New York Road, Leeds (Leeds 32691).

East Midlands Gas Board, De Montford Street, Leicester (Leicester 50022).

West Midlands Gas Board, Wharf Lane, Solihull, Warwickshire (Solihull 6888).

Wales Gas Board, Snelling House, Bute Terrace, Cardiff (Cardiff 33131).

Eastern Gas Board, Sun Building, Clarendon Road, Watford (Watford 28555).

North Thames Gas Board, 30 Kensington Church Street, London, W.8 (WEStern 8141).

South Eastern Gas Board, Katharine Street, Croydon, Surrey (CROydon 4466).

Southern Gas Board, 164 Above Bar, Southampton (Southampton 75544).

South Western Gas Board, 9a Quiet Street, Bath (60411).

FUELS—GAS (L.P.G.)

Shell Mex & B.P. Gases Ltd., Shell Mex House, Strand, London, W.C.2 (TEMple Bar 1234). ("*Bottogas*"—*Butane, Propagas—Propane.*)

FUEL OIL

Shell Mex & B.P. Ltd., Shell Mex House, Strand, London, W.C.2 (TEMple Bar 1234). (*Domestic and Industrial Oil Fuels.*)

FUELS—SOLID SMOKELESS

Coalite & Chemical Products Ltd., P.O. Box No. 21, Chesterfield, Derbyshire (Bolsover 2281).
103 Mound Street, London, W.1 (Grosvenor 7931). ("*Coalite*" *smokeless coal.*)

National Carbonising Co. Ltd., Thorny House, 34 Smith Square, London, S.W.1 (ABBey 7331).
Fullerton Lodge, Prohill Drive, Mansfield, Nottinghamshire (Mansfield 2357). ("*Rexco*" *Smokeless Coal.*)

National Coal Board, Hobart House, Grosvenor Place, London, S.W.1 (BELgravia 2020). (*Sunbrite, Phurnacite, Homefire, Roomheat, Multiheat, Anthracite, Welsh dry steam.*)

FUEL OIL STORAGE TANKS (MILD STEEL)

E. G. Reeve & Sons Ltd, Burton Road, St. Faith's Industrial Estate, Norwich, Norfolk (Norwich 47228).

T. G. Binner (Boilers) Ltd., New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

FUEL OIL STORAGE TANKS (REINFORCED CONCRETE)

Borsari & Co., Zollikon-Zurich, Switzerland (24 96 18). (*Tile-lined underground tanks of reinforced concrete.*)

FUME REMOVAL EQUIPMENT

Ambuco Ltd., 49 Moorgate, London, E.C.2 (METropolitan 9242/4).

Dron & Dickson Ltd., 158 Bath Street, Glasgow, C.2 (Douglas 1337). (*Ambuco Cyclones scrubbers and fabric arresters.*)

The British Ceca Co. Ltd., 175 Piccadilly, London, W.1 (HYDe Park 5131). ("*Oxycat*" *Catalytic Oxidation.*)

Keith Blackman Ltd., Mill Mead Road, Tottenham, London, N.17 (TOTtenham 4522). ("*Tornado.*")

The Constructional Engineering Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (Midland 4753/4). ("*Titan,*" "*Titan-Zschocke,*" "*Titan-DB.*")

Centri Spray Ltd., Green Dragon House, 64/70 High Street, Croydon, Surrey (Croydon 7431).

Centri Spray G.m.b.H., 10 neue Weyerstrasse, Cologne, Germany (tel.: 23 59 28).

Centri Spray Sarl., 88 Ave. Victor Hugo, Paris, France (tel.: 704 3066). (*Centri Spray Air Washers.*)

Constant Air Systems Ltd., Raebarn House, Northolt Road, Harrow, Middlesex (CONcord 0288, 4 lines).
Wolverley House, Digbeth, Birmingham, 5 (Midland 5148).

Chemical Construction (GB) Ltd, Regal House, Twickenham, Middlesex (Pope's Grove 4455). ("*Chemico*" *Pease Anthony Venturi Scrubbers.*)

Drummond Dust & Fume Extractors Ltd., Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (LARkswood 4441/2).

Fan Systems Ltd., 2 Brazil Street, Manchester, 1 (Central 7156). (*Fan Installations.*)

Fan Application & Engineering Ltd., 76 Rivington Street, London, E.C.2 (SHOreditch 6288).

Head Wrightson & Co. Ltd., Teesdale Ironworks, G.P.O. Box 10, Thornaby on Tees, Stockton on Tees, Co. Durham (Stockton 62241).

James Howden & Co. Ltd., 195 Scotland Street, Glasgow, C.5 (South 2131).
15 Grosvenor Place, London, S.W.1 (BELgravia 1301).

Kavag, Gondsroth/Bay Frankfurt, Germany 06055-515.

U.K. Office: Somerset House, Georges Street, Halifax, Yorkshire (Halifax 65109). (*Catalytic combustion equipment.*)

Morgan Air Treatments Ltd., 55/57 Salop Street, Birmingham, 12 (Vic 2096).

Matthews & Yates, Cyclone Works, Swinton, Manchester (STD 061 Swinton 2273). ("*Cyclone.*")

R. J. Richardson & Sons Ltd., Engineering & Shotglass Works, 37 Commercial Street, Birmingham, 1 (Midland 2281((PBX).

Spencer & Halstead, Bridge Works, Ossett, Yorkshire (Ossett 821).

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (Kingston 7799). ("*Tubix*" *Centrifugal Collectors,* "*Airmix*" *Wet Collectors.*)

Visco Ltd., Stafford Road, Croydon, Surrey (MUNicipal 3861/9).

Western Precipitation Division, Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711). ("*Joy*" *Microdyne Scrubbers and Tubal Air Scrubbers, Precipitators, Mechanical Dust Collectors, Bag Filters.*)

FURNACES, KILNS, OVENS, ETC.

The Constructional Engineering Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (Midland 4753/4). ("*Titan,*" "*Titan-Zschocke,*" "*Titan-DB.*")

R. N. Catterson Smith Ltd., Exhibition Grounds, Wembley, Middlesex (Wembley 4291). (*Electric Furnaces.*)

G. F. Rider (Process Plant) Ltd., Leeds Place Works, Tollington Park, London, N.4 (ARChway 0404/5/6).

GAS CLEANING PLANT

James Howden & Co. Ltd., 195 Scotland Street, Glasgow, C.5 (South 2131).
15 Grosvenor Place, London, S.W.1 (BELgravia 1301).

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233).

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (KINgston 7799). ("*Tubix*" *Centrifugal Collectors,* "*Airmix*" *Wet Collectors.*)

Western Precipitation Division, Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711). ("*Joy*" *Microdyne scrubbers and turbulaire scrubbers, precipitators, mechanical dust collectors, bag filters.*)

GAS CLEANING PLANT EFFICIENCY TESTING

Pionex Ltd., Werneth House, Stockport Road, Gee Cross, Hyde, Cheshire (Hyde 3969).

GAS CLEANING PLANT MAINTENANCE

Pionex Ltd., Werneth House, Stockport Road, Gee Cross, Hyde, Cheshire (Hyde 3969).

GAS HEATING EQUIPMENT

Keith Blackman Ltd., Mill Mead Road, Tottenham, London, N.17 (TOTtenham 4522). ("*Tornado.*")

F. A. Borchardt Ltd., Mill Lane, Old Swan, Liverpool, 13 (Stoneycroft 4757). ("*DRU-gasar*" *balanced flue gas heaters.*)

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).

Radiation Central Heating Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (WILlesden 1234). (*Central Heating Systems.*)

Radiation Gas Fires Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (WILlesden 1234). (*Gas Fires.*)

Heat & Air Systems Ltd., 155 Clarence Street, Kingston upon Thames (Kingston 2441).
Tiviotdale Chambers, Lancashire Hill, Stockport, Cheshire (Stockport 4679). (*Dust Foil Dust Collectors.*)

Geoffrey Woods Ltd., Pear Tree Road, Stanway, Colchester, Essex (Colchester 5131). Telex 18231.

GAS HEATING EQUIPMENT (BUTANE AND PROPANE)

F. A. Borchardt Ltd., Mill Lane, Old Swan, Liverpool, 13 (Stoneycroft 4757). ("*DRUgasar*" *Balanced Flue Gas Heaters.*)

Geoffrey Woods Ltd., Pear Tree Road, Stanway, Colchester, Essex (Colchester 5131). Telex 18231.

GAS SCRUBBERS AND WASHERS

The Constructional Engineering Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (Midland 4753/4). ("*Titan,*" "*Titan-Zschocke,*" "*Titan-DB.*")

Chemical Construction (GB) Ltd., Regal House, Twickenham, Middlesex (Pope's Grove 4455). (*Chemico Pease Anthony Venturi Scrubbers.*)

Drummond Dust and Fume Extractors Ltd., Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (LARkswood 4441/2).

Industrial & Metallurgical Equipment Ltd., Wettern House, Dingwall Road, Croydon, Surrey (MUNicipal 3641). ("*Elbair*" *and* "*Meduse*" *Scrubbers.*)

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (KINgston 7799). ("*Tubix*" *Centrifugal Collectors,* "*Airmix*" *Wet Collectors.*)

James Howden & Co. Ltd., 195 Scotland Street, Glasgow, C.5 (South 2131).
15 Grosvenor Place, London, S.W.1 (BELgravia 1301).

Western Precipitation Division, Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711). ("*Joy*" *microdyne scrubbers, turbulaire scrubbers, precipitators, mechanical dust collectors and bag filters.*)

GAS TIGHT DAMPERS

Metropolitan Engineering Co. Ltd., 14 Earl Cottages, Earl Road, London, S.E.1 (BERmondsey 4331).

GRIT ARRESTORS

Alldays & Onions Ltd., P.O. Box 234, Great Western Works, Sydenham Road, Birmingham, 11 (Victoria 2251/4).

Ambuco Ltd., 49 Moorgate, London, E.C.2 (METropolitan 9249/4).

Dron & Dickson Ltd., 158 Bath Street, Glasgow, C.2. (*Ambuco cyclones, scrubbers and fabric arresters.*)

Keith Blackman Ltd., Mill Mead Road, Tottenham, London, N.17 (Tottenham 4522). ("*Tornado.*")

Buell Ltd., 8/10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761). ("*Buell/Van Tongeren*" *Dust Collection and Powder Classification Plants,* "*Buell/Buttner*" *Industrial Drying and Cooling Plants.*)

The Constructional Engineering Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (Midland 4753/4). ("*Titan,*" "*Titan-Zschocke,*" "*Titan-DB.*")

Collectron Ltd., 29 Windsor Street, Cheltenham, Gloucestershire (Cheltenham 21195/8). ("*Collectron.*")

Centri Spray Ltd., Green Dragon House, 64/70 High Street, Croydon, Surrey (Croydon 7431).

Centri Spray G.m.b.H., 10 neue Weyerstrasse, Cologne, Germany (23 59 28).

Centri Spray Sarl., 88 Ave. Victor Hugo, Paris, France (tel. 704 3066). (*Centri Spray Air Washers.*)

Combustion Equipment Ltd., 322 St. John Street, London, E.C.1 (BRUnswick 7785/6). (*Cory grit arresters, aluminium cladding for chimneys, Dribore chimneys, furnace baffle for shell boilers, waste material disposal furnaces.*)

Fan Systems Ltd., 2 Brazil Street, Manchester, 1 (Central 7156). (*Fan Installations.*)
Fan Application Ltd., 76 Rivington Street, London, E.C.2 (SHOreditch 6288).

Rodway & Taylor (Birmingham) Ltd., 85/90 Buckingham Street, Birmingham, 19 (Central 4027/8).

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (ARChway 0233).

The Incinerator Co. Ltd., 14 Coopers Row, Tower Hill, London, E.C.3 (ROYal 9931, 5 lines). ("*Scrubber type.*")

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (Kingston 7799). ("*Tubix*" *Centrifugal Collectors,* "*Airmix*" *Wet Collectors.*)

Tipton Tub & Tube Co. Ltd., Bloomfield Road, Tipton, Staffordshire (Tipton 1011 and 3418). ("*Centri flovane*" *grit arresters.*)

Western Precipitation Division, Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711). (*"Joy" microdyne scrubbers and tubulaire scrubbers, precipitators, mechanical dust collectors, bag filters.*)

GRIT ARRESTORS MAINTENANCE

Pionex Ltd., Werneth House, Stockport Road, Gee Cross, Hyde, Cheshire (Hyde 3969).

HEAT EXCHANGERS

James Howden & Co. Ltd., 195 Scotland Street, Glasgow, C.5 (South 2131).
15 Grosvenor Place, London, S.W.1 (BELgravia 1301).

HEATERS, AIR

Auto Combustions (London) Ltd., 360/364 Wandsworth Road, London, S.W.8 (MACaulay 9121) (4 lines). ("*Swirlamiser Vapormiser Autoflame.*)

Construction Engineering Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (Midland 4753/4). ("*Titan,*" "*Titan-Zschocke,*" "*Titan-DB.*")

Kavag, 6461 Gondsroth/Bay Frankfurt, Germany (06055/515).

U.K. Office: Somerset House, Georges Street, Halifax (Halifax 65109).

Matthews & Yates Ltd., Cyclone Works, Swinton, Manchester (STD 061 Swinton 2273). ("*Cyclone.*")

Powell Duffryn Ltd., Vale Road, Camberley, Surrey (Camberley 3491).

Radiation Parkray Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234).

Wanson Co. Ltd., 7 Elstree Way, Borehamwood, Herts. (Elstree 5696). Telex 261169. ("*Thermobloc*" *gas or oil-fired air heaters up to 16M Btu/hr.*)

Geoffrey Woods Ltd., Pear Tree Road, Stanway, Colchester, Essex (Colchester 5131). Telex 18231.

HEATERS, ELECTRIC

Dimplex Ltd., Millbrook Trading Estate, Millbrook, Southampton, Hampshire (Southampton 74425). (*Electric Heaters*).

H. Frost & Co. Ltd., Sunhouse Works, New Street, Walsall, Staffordshire (Walsall 25551).

HEATERS, FAN

H. Frost & Co. Ltd., Sunhouse Works, New Street, Walsall, Staffordshire (Walsall 25551).

HEATERS, INFRA RED

H. Frost & Co. Ltd., Sunhouse Works, New Street, Walsall, Staffordshire (Walsall 25551).

Dimplex Ltd., Millbrook Trading Estate, Millbrook, Southampton, Hampshire (Southampton 74425/9).

HEATERS, LIQUID PHASE

J. Stone & Co. (Deptford) Ltd., Stone Vapor Boiler Division, Arklow Road, London, S.E.14 (TIDeway 1202).
51 Summer Road, Birmingham, 3 (Central 9385).
Bleasby Street, Oldham (Main 5421).
Bulldale Street, Yoker, Glasgow, W.4 (Scotstoun 3401). ("*Stone vapor.*")

HEATERS, WALL PANEL

Dimplex Ltd., Millbrook Trading Estate, Millbrook Southampton, Hampshire (Southampton 74425/9).

H Frost & Co. Ltd., Sunhouse Works, New Street, Walsall, Staffordshire (Walsall 25551). ("*Sunhouse*" *electric heaters.*)

HEATERS, WATER

Dean Sales Promotion Ltd., Accrington Road, Burnley (Burnley 21711). ("*Dean*" *and* "*Maxol.*")

Charles Lathe & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffordshire (Tipton 1887). ("*Claco.*")

Radiation Parkray Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (WILlesden 1234).

HEATING EQUIPMENT—DOMESTIC

F. A Borchardt Ltd., Mill Lane, Old Swan, Liverpool, 13 (Stoneycroft 4757). ("*DRU-gasar*" *balanced flue gas heaters.*)

Dimplex Ltd., Millbrook Trading Estate, Millbrook, Southampton, Hampshire (Southampton 74425). (*Electric Heaters.*)

H Frost & Co. Ltd., Sunhouse Works, New Street, Walsall, Staffordshire (Walsall 25551). ("*Sunhouse*" *Electric Heaters.*)

Charles Lathe & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffordshire (Tipton 1887). ("*Claco.*")

Morphy Richards Ltd., St. Mary Cray, Orpington, Kent (Orpington 2700). ("*Morphy Richards*" *Domestic Electric Appliances.*)

Thomas Potterton Ltd., 20/30 Buckhold Road, London, S.W.18 (VANdyke 7202). (*Central Heating Equipment.*)

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).

Radiation Central Heating Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (WILlesden 1234). ("*Duct-air*" *Gas Warm Air Central Heating Units.*)

Radiation Gas Fires Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (WILlesden 1234). (*Gas Fires.*)

Radiation Parkray Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (WILlesden 1234).

HEATING EQUIPMENT—INDUSTRIAL (PROCESS)

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321).
148 Edmond Street, Birmingham, 3 (Central 6131).
54 West Nile Street, Glasgow, C.1 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 8326).
Norfolk House, Grey Street, Newcastle upon Tyne, 1 (Newcastle upon Tyne 29212).

Bering Ltd., Doman Road, Camberley, Surrey (Camberley 4191). (*Oil and gas high-speed direct fired heaters.*)

Borsari, Zollikon - Zurich, Switzerland (24 96 18).

W. G. Cannon & Sons Ltd., Carolyn House, Dingwall Road, Croydon, Surrey (Croydon 2201).
24 The Grove, Gosforth, Newcastle upon Tyne, 3 (Gosforth 53847). (*Heating and Ventilating Contractors.*)

R. M. Catterson-Smith Ltd., Exhibition Grounds, Wembley (Wembley 4291). (*Electric Furnaces.*)

Isopad Ltd., Borehamwood, Hertfordshire (ELStree 2817).

Luwa (UK) Ltd., 36/41 High Street, South Norwood, London, S.E.25 (LIVingstone 6516).

Morgan Air Treatments Ltd., 55/57 Salop Street, Birmingham, 12 (Vic 2096).

Matthews & Yates, Cyclone Works, Swinton, Manchester (STD 061 Swinton 2273). ("*Cyclone.*")

Thomas Potterton Ltd., 20/30 Buckhold Road, London, S.W.18 (VANdyke 7202). (*Central Heating Equipment.*)

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (WILlesden 1234). (*Gas fires.*)

Schieldrop Ltd., High Street, Stotfold, Hitchin, Hertfordshire (Stotfold 414). (*Gas and oil burner manufacturers.*)

Spencer & Halstead Ltd., Ossett, Yorkshire (Ossett 821).

Wanson Co. Ltd., 7 Elstree Way, Borehamwood, Herts. (Elstree 5696). Telex 261169. ("*Thermobloc*" *gas or oil-fired air heaters up to 16m Btu-hr.*)

Geoffrey Woods Ltd., Pear Tree Road, Stanway, Colchester, Essex (Colchester 5131). Telex 18231.

HEATING SYSTEMS—OIL

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).

Geoffrey Woods Ltd., Pear Tree Road, Stanway, Colchester, Essex (Colchester 5131). Telex 18231.

Norris Warming Co. Ltd., Burley House, 5/11 Theobalds Road, London, W.C.1 (HOLborn 7833).
2/3 Melrose Avenue, Clifton, 8 (Bristol 30261).
Norris House, 611 Stretford Road, Manchester, 16 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle upon Tyne (Newcastle 28037).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

Shell Mex & B.P. Ltd., Shell Mex House, Strand, London, W.C.2 (TEMple Bar 1234).

HEATING TAPES—ELECTRIC

Isopad Ltd., Barnet By Pass, Borehamwood, Herts. (ELStree 2817). (*Electric heating tapes and mantles.*)

HUMIDIFIERS

Heather Filters Ltd., 7 Kendall Place, Baker Street, London, W.1 (HUNter 1801). ("*Satonair.*")

Spencer & Halstead, Ossett, Yorkshire (Ossett 821).

INCINERATORS

Bering Ltd., Doman Road, Camberley, Surrey (Camberley 4191). ("*Kleenaire*" *smokeless incinerators.*)

Heenan & Froude Ltd., Shrub Hill, Worcester, Worcestershire (Worcester 23461, 14 lines).

The Incinerator Co. Ltd., 14 Coopers Row, Tower Hill, London, E.C.3 (ROYal 9931, 5 lines). (*Incinerators for all industrial and municipal wastes, cremators for animal wastes aftes burning units for furnaces of all types.*)

Kavag, 6461 Gondsroth/Bay Frankfurt, Germany (066055).

U.K. Office: Somerset House, Georges Street, Halifax (Halifax 6510).

G. F. Rider (Process Plant) Ltd., Leeds Place Works, Tollington Park, London, N.4 (ARChway 0404/5/6).

Riley (IC) Products Ltd., 19 Woburn Place, London, W.C.1 (TERminus 2622).

Universal Machinery & Services Ltd., Viceroy Works, Millshaw, Beeston, Leeds, 11 (Leeds 73761). (*Universal Incinerators.*)

Vauxhall Boiler Co. Ltd., Banbury, Oxfordshire (Banbury 3437). (*Vauxhall Joseph Goder incinerators.*)

Victor Products (Wallsend) Ltd., G.P.O. Box 10, Wallsend, Northumberland (Wallsend 628331).
50 Pall Mall, London, S.W.1 (WHItehall 7412).
Victoria Chambers, Dale Road, Matlock, Derbyshire (Matlock 3059). (*Victor Incinerators.*)

INDUCED DRAUGHT PLANT

Application & Engineering Ltd., 76 Rivington Street, London, E.C.2 (SHOreditch 6288).

INSTRUMENTS, GAUGES, METERS, ETC.

Airflow Developments Ltd., Lancaster Road, High Wycombe, Buckinghamshire (High Wycombe 25252).

LECTURE NOTES, SLIDES, AND FILM-STRIPS

National Society for Clean Air, Field House, Breams Buildings, London, E.C.4 (CHAncery 5038). ("*Clean Air*" *notes for teachers and lecturers. Leaflets.*)

Diana Wyllie Ltd., 3 Park Road, Baker Street, London, N.W.1 (PADdington 3330). (*Colour filmstrips and lecture notes on air pollution, chronic bronchitis, and oil heaters etc.*)

PUMPS

Charles Austen Pumps Ltd., Petersham Works, 100 Royston Road, Byfleet, Surrey (Byfleet 43224/5). ("*Dymax*" *small oil-free diaphragm pumps.*)

RADIANT HEATING

H. Frost & Co. Ltd., Sunhouse Works, New Street, Walsall, Staffordshire (Walsall 2551). ("*Sunhouse*" *Electric Heaters.*)

Interoven Ltd., Montagu Mews North, Montagu Place, London, W.1 (WELbeck 6864/5). ("*Homer*" *back boilers and open fires.*)

Radiation Gas Fires Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (WILlesden 1234). (*Gas fires.*)

Radiation Parkray Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (WILlesden 1234).

Richard James (Westminster) Ltd., Ferry House, Lacy Road, Putney, S.W.15 (PUTney 7792).

RADIATORS

Dimplex Ltd., Millbrook Trading Estate, Millbrook, Southampton, Hampshire (Southampton 74425/9). (*Electrical Heaters.*)

Thomas Potterton, 20/30 Buckholt Road, London, S.W.18 (Vandyke 7202). (*Central Heating Equipment.*)

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).

REFRIGERATION PLANT

John Bass Ltd., B.M.B., Crawley Works, Fleming Way, Crawley, Sussex (Crawley 28765). ("*Bassaire.*")

W.H.S. (Pathfinder) Ltd., Brockhampton Lane, Havant, Hampshire (Havant 3661). ("*Pathfinder*" *critical atmosphere control equipment.*)

RESEARCH AND DEVELOPMENT FACILITIES

The British Non Ferrous Metal Research Association, Euston Street, London, N.W.1 (EUSton 6411).

ROOM HEATERS—ELECTRIC

Dimplex Ltd., Millbrook Trading Estate, Millbrook, Southampton, Hampshire (Southampton 74425). (*Electrical Heaters.*)

H. Frost & Co. Ltd., Sunhouse Works, New Street, Walsall, Staffordshire (Walsall 25551). ("*Sunhouse*" *Electric Heaters.*)

Powell Duffryn Heating Ltd., Vale Road, Camberley, Surrey (Camberley 3491).

ROOM HEATERS—GAS

Cannon Industries Ltd., Deepfields, Bilton, Staffs. (Bilston 43161).
4 Old Park Lane, London, W.1 (HYDe Park 4861).
202b Kensington High Street, London, W.8 (Western 0123). (*Gasmiser, Slimline.*)

Radiation Gas Fires Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (WILlesden 1234). (*Gas Fires.*)

ROOM HEATERS—SOLID FUEL (OPEN FIRES)

Richard Haighton Ltd., Cannin Street, Burnley, Lancashire (Burnley 5206/7). ("*Lofire.*")

Interoven Ltd., Montagu Mews, Montagu Place, London, W.1 (WELbeck 6864/5). ("*Homer*" *back boilers and open fires.*)

Jones & Campbell Ltd., P.O. Box No. 36, Torwood Foundry, Larbert, Stirlingshire (Larbert 2114, 3 lines). ("*Tor,*" "*Torglow,*" "*Torwood.*")

Charles Lathe & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffs. (Tipton 1887). ("*Claco*" *solid fuel burning appliances.*)

Radiation Parkray Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (WILlesden 1234).

SMOKE DENSITY GAUGES AND METERS

Photoelectronics (Arcall) Ltd., 92 Oldfield Road, Sutton, Surrey (Fairlands 4571). (*M.O.M.*)

SMOKE INDICATORS

Radiovisor Parent Ltd., Stanhope Works, High Path, London, S.W.19 (CHErrywood 3351).

Ronald Trist Controls Ltd., Bath Road, Slough, Bucks. (Slough 25041).

STOKERS—INDUSTRIAL

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (EUSton 4321).
148 Edmond Street, Birmingham, 3 (Central 6131).
54 West Nile Street, Glasgow, C.1 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 8326).
Norfolk House, Grey Street, Newcastle upon Tyne, 1 (Newcastle upon Tyne 29212).

Crosthwaite Furnaces & Scriven Machine Tools Ltd., York Street Ironworks, Leeds, 9. (Leeds 32411/2). (*Forced draught furnaces.*)

Edwin Danks & Co. (Oldbury) Ltd., P.O. Box 4, Oldbury, Birmingham (Broadwell 2531).

James Proctor Ltd., P.O. Box 19, Hamilton Street, Burnley, Lancashire (Burnley 31021). (*Mechanical stokers and coal handling.*)

Riley (IC) Ltd., 19 Woburn Place, London, W.C.1 (TERminus 2622).

John Thompson Triumph Ltd., Triumph Works, Kirkstall Road, Leeds, 3 (Leeds 34841). ("*Triumph*" *Stokers.*)

STOVES—ANTHRACITE

Pithers Radiant Stoves Ltd., 34/38 Mortimer Street, London, W.1 (MUSeum 2089 and 6573). (*Pithers Radiant Stoves.*)

TEMPERATURE AND HUMIDITY RECORDS

C. F. Casella & Co. Ltd., Regent House, Britannia Walk, London, N.1 (CLErkenwell 8581/7). (*Scientific and meteorological instruments.*)

THERMAL STORAGE SYSTEMS

Metropolitan Engineering Co. Ltd., 14 Earl Cottages, Earl Road, London, S.E.1 (BERmondsey 4331).

ULTRA VIOLET LAMPS FOR AIR AND WATER DISINFECTION

Englehard Hanovia Lamps, Bath Road, Slough, Bucks. (Burnham 500).

VENTILATORS

W. G. Cannon & Sons Ltd., Carolyn House, Dingwall Road, Croydon, Surrey (Croydon 2201).
24 The Grove, Gosforth, Newcastle upon Tyne, 3 (Gosforth 53847). (*Heating and Ventilating Contractors.*)

Morgan Air Treatments Ltd., 55/57 Salop Street, Birmingham, 12 (Victoria 2096).

Marshall & Parsons Ltd., 1111 London Road, Leigh on Sea, Essex (Southend 74867).

WARM AIR HEATING SYSTEMS

A. H. Bibbey (Sales) Ltd., High Wych, Sawbridgeworth, Hertfordshire (Sawbridgeworth 2050/3406).
No. 2 Factory, Industrial Estate, Dunmow Road, Bishops Stortford, Hertfordshire (Bishops Stortford 3407/8). ("*Husqvarna.*")

W. G. Cannon & Sons Ltd., Carolyn House, Dingwall Road, Croydon, Surrey (Croydon 2301).
24 The Grove, Gosforth, Newcastle upon Tyne, 3 (Gosforth 53847). (*Heating and Ventilating Contractors.*)

Constant Air Systems Ltd., Raebarn House, Northolt Road, Harrow, Middlesex (CONcord 0288, 4 lines).
Wolverly House, Digbeth, Birmingham, 5 (Midland 5184).

Fan Application Engineering Ltd., 76 Rivington Street, London, E.C.2 (SHOreditch 6288).

Morgan Air Treatments Ltd., 55/57 Salop Street, Birmingham, 12 (Vic 2096).

Norris Warming Co. Ltd., Burley House, 5/11 Theobalds Road, London, W.C.1 (HOLborn 7833).
2/3 Melrose Avenue, Clifton, 8 (Bristol 30261).
Norris House, 611 Stretford Road, Manchester, 16 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 28037).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

Radiation Central Heating Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (WILlesden 1234). ("*Duct-air*" *Gas Warm Air Central Heating Units.*)

Richard James (Westminster) Ltd., Ferry House, Lacy Road, Putney, London, S.W.15 (PUTney 7712).

Wanson Co. Ltd., 7 Elstree Way, Borehamwood, Hertfordshire (Elstree 5696). Telex 261169. ("*Thermobloc*" *Industrial Heating Systems.*)

WET ARRESTERS

Buell Ltd., 8/10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761). ("*Buell/Van Tongeren*" *Dust Collection and Power Classification Plant,* "*Buell/Buttner*" *Industrial Drying and Cooling Plants.*)

Collectron Ltd., 29 Windsor Street, Cheltenham, Gloucester (Cheltenham 22195/7). ("*Collectron.*")

Centri Spray Ltd., Green Dragon House, 64/7 High Street, Croydon, Surrey (Croydon 7431).

Centri Spray G.m.b.H., 10 neue Weyerstrasse, Cologne, Germany (23 59 28).

Centri Spray Sarl., 88 Ave. Victor Hugo, Paris, France (tel.: 704 3066). (*Centri Spray Air Washers.*)

Drummond Dust & Fume Extractors, Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (Larkswood 4441/2).

Rodway & Taylor (Birmingham) Ltd., 85/90 Buckingham Street, Birmingham, 19 (Central 4027/8).

Spencer & Halstead Ltd., Bridge Works, Ossett, Yorkshire (Ossett 821).

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (Kingston 7799). ("*Tubix*" *Centrifugal Collectors,* "*Airmix*" *Wet Collectors.*)

Visco Ltd., Stafford Road, Croydon, Surrey (Municipal 3861/9).

Wellman Incandescent Furnace Co. Ltd., Cornwall Road, Smethwick, 40, Staffordshire (Smethwick 2121). (*Incandescent/Whiting Wet Arresters for cupolas.*)

WASTE BOILER PLANT

G. F. Rider (Process Plant) Ltd., Leeds Place Works, Tollington Park, London, N.4 (ARChway 0404/5/6).

The Incinerator Co. Ltd., 14 Coopers Row, Tower Hill, London,E .C.3 (ROYal 9931, 5 lines). (*After burning units for furnaces of all types.*)

WASTE MATERIAL DISPOSAL FURNACES

Combustion Equipment Ltd., 322 St. John Street, London, E.C.1 (Brunswick 7785) (*Cory grit arresters, aluminium cladding for chimneys, Dribore chimneys, furnace baffle for shell boilers, waste material disposal furnaces.*)

The Incinerator Co. Ltd., 14 Coopers Row, Tower Hill, London, E.C.3 (ROYal 9931, 5 lines). (*Incinerators for all industrial and municipal wastes, after burning units for furnaces of all types.*

WASTE HEAT RECOVERY

Heenan & Froude Ltd., Shrub Hill, Worcester (Worcester 23461, 14 lines).

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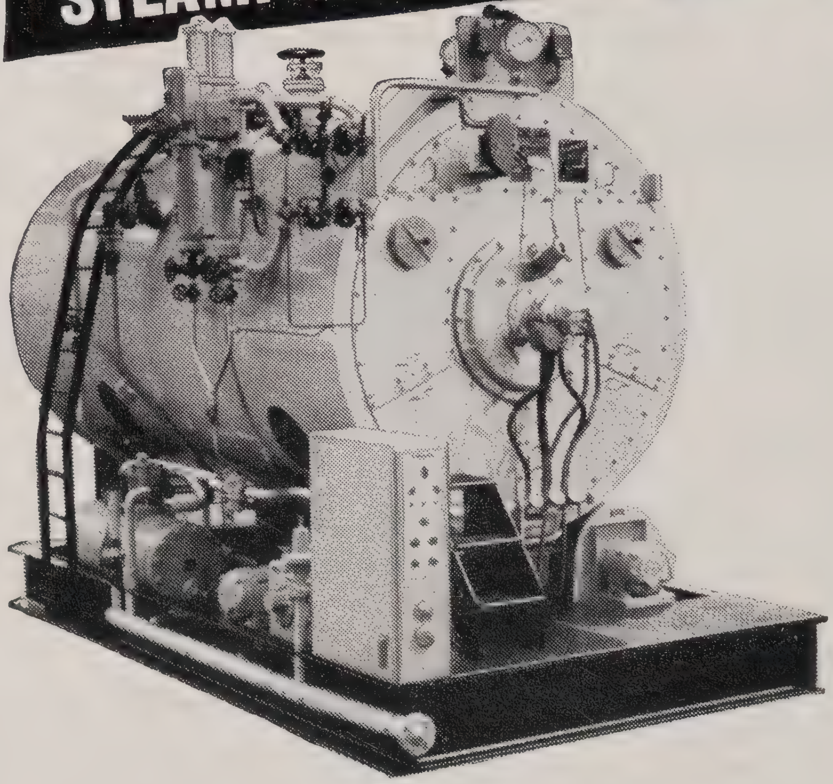

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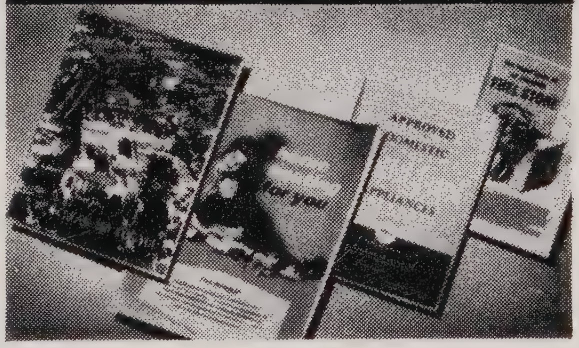

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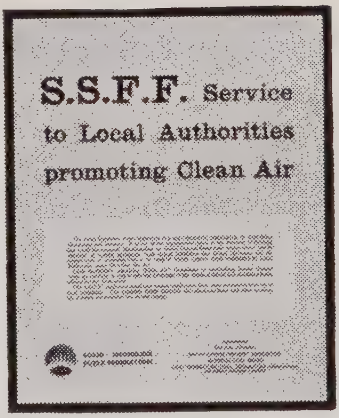

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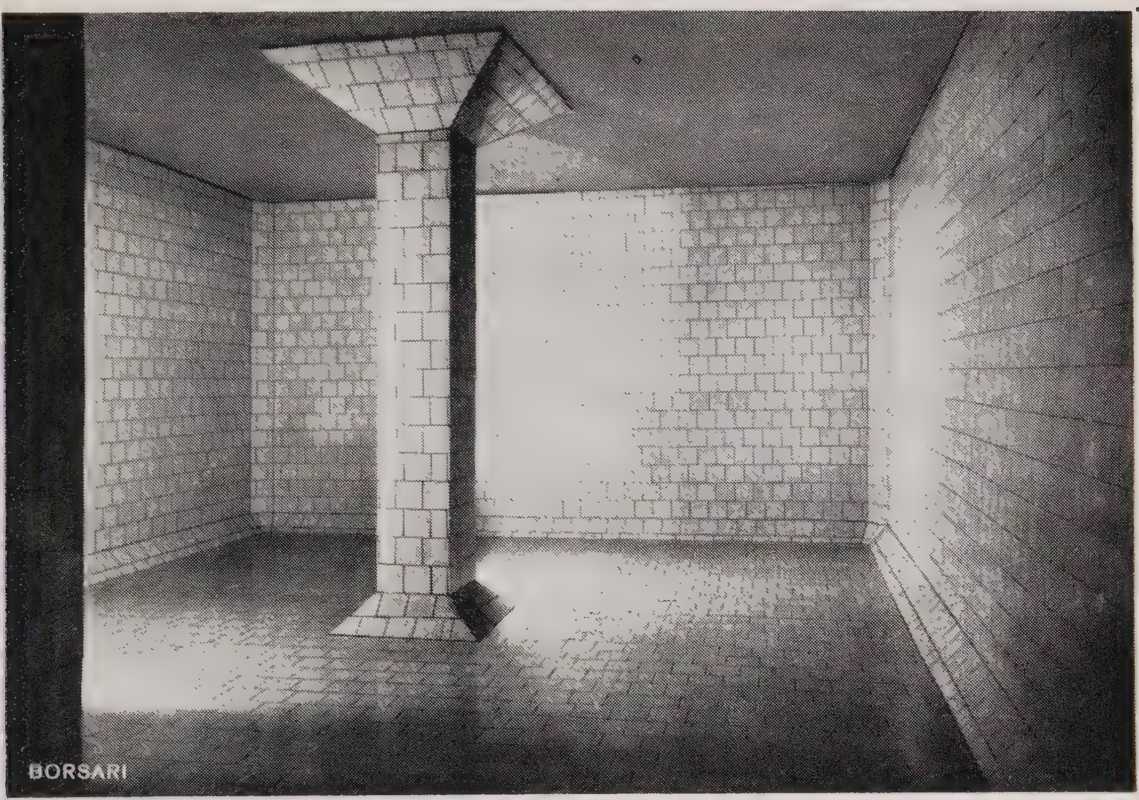

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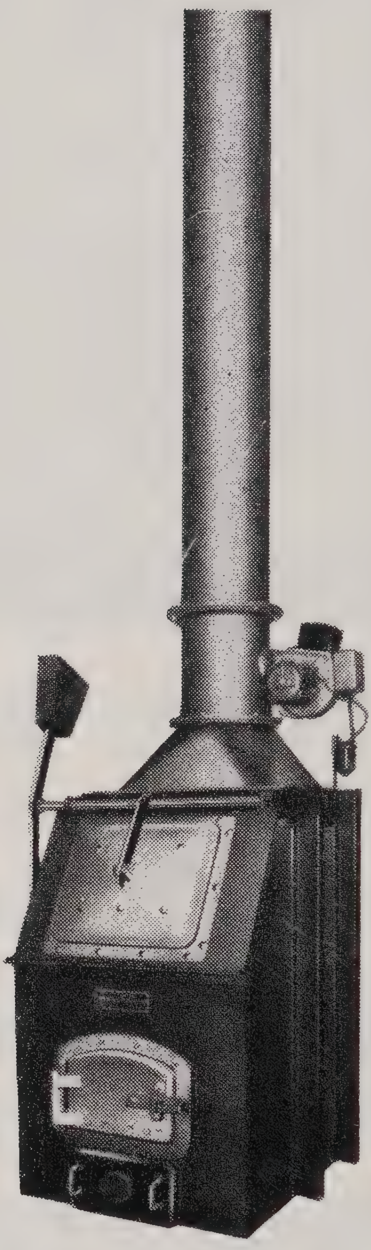

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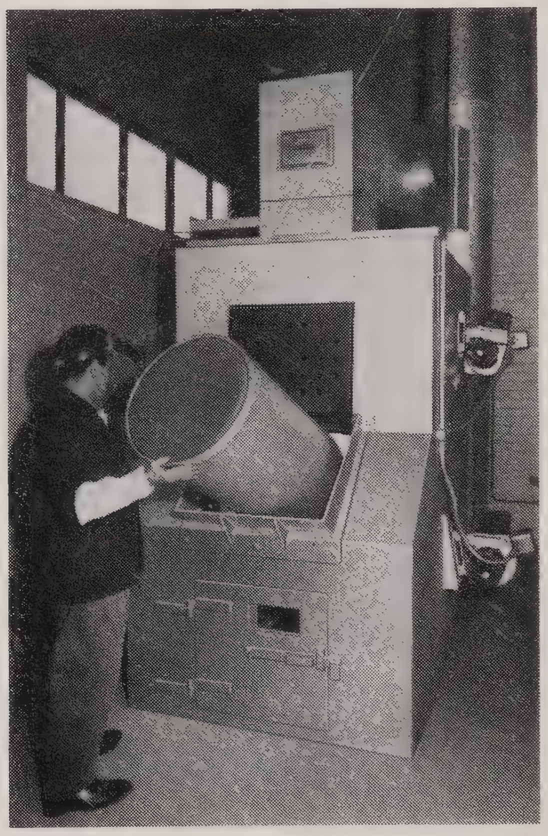

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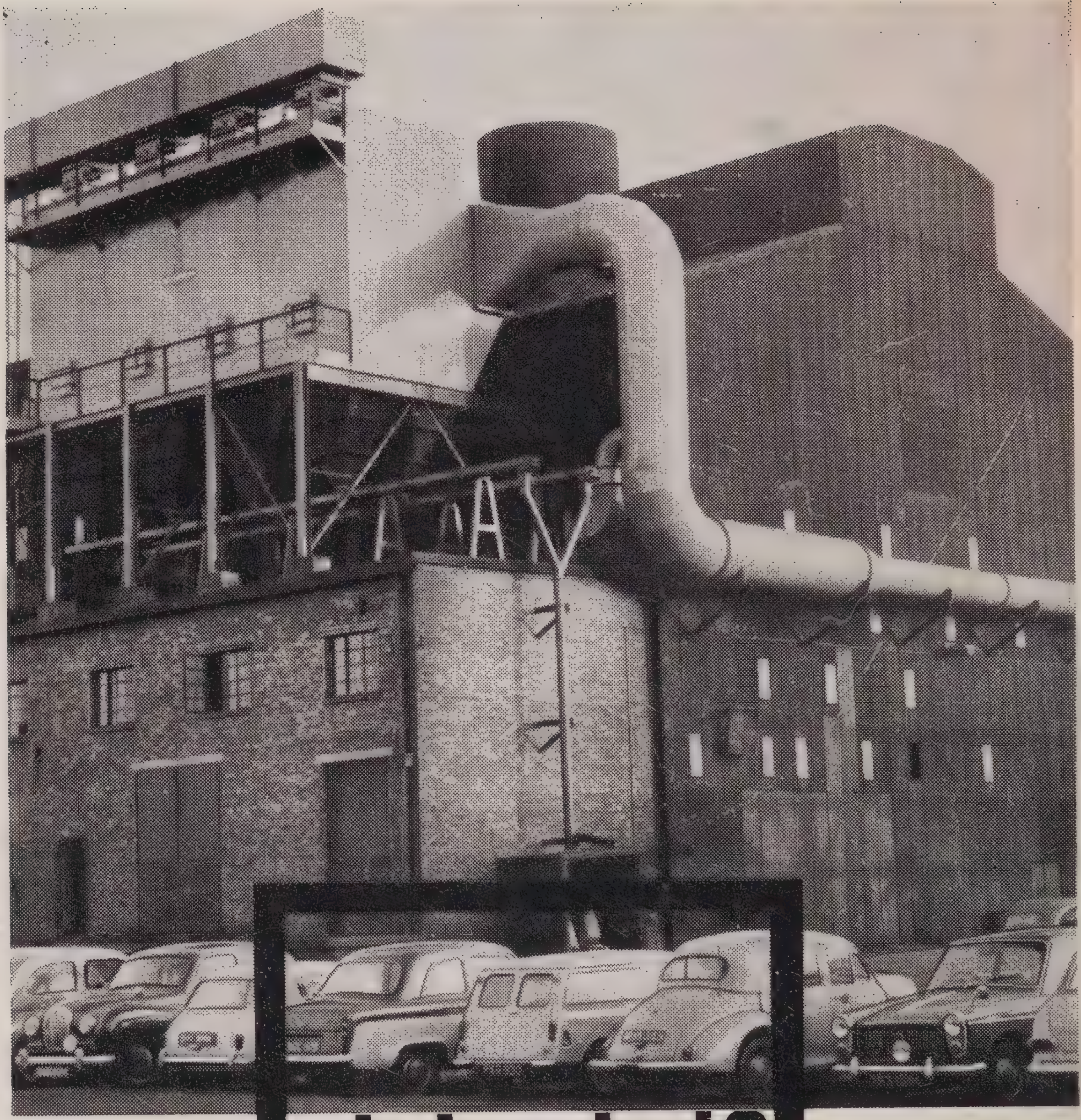

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1967–1968

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…in (see page 47)

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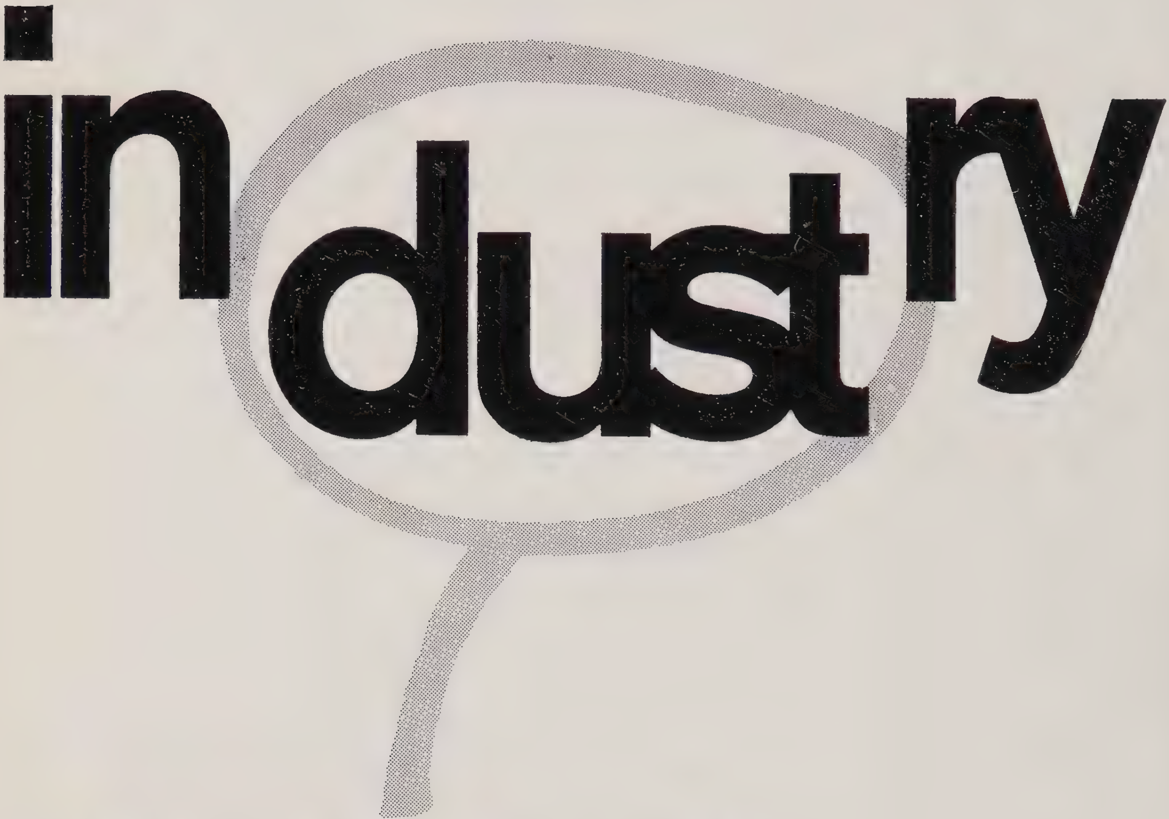

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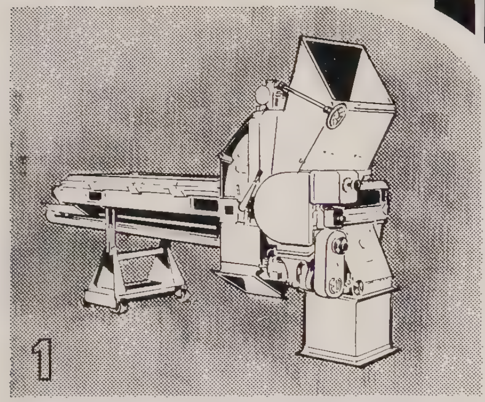
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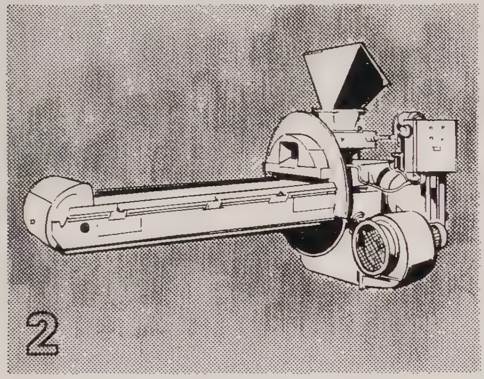
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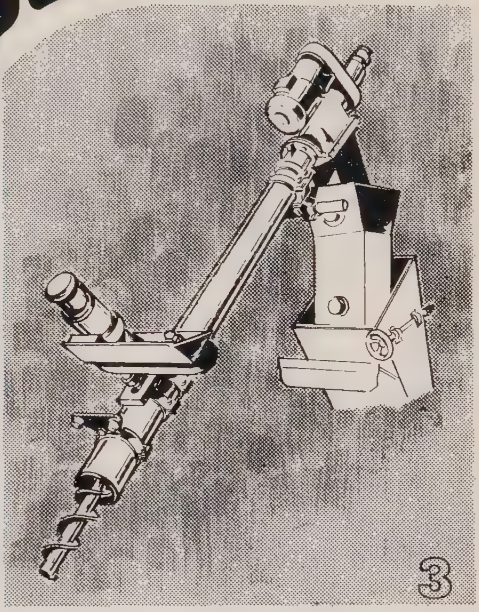
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The first commercially successful chain grate unit for shell boilers to provide efficient smokeless combustion with a diversity of fuels. Now also available in sizes 52 and 60 for use where larger grate areas are required.

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The chain grate travels in reverse to provide built-in ash removal. A natural development from the Oldbury Stoker, designed to burn better quality and modern fuels unsuitable for the conventional grate, the spreader stoker reduces manual attention and increases boiler availability; and obtains positive savings in fuel consumption and operating costs.

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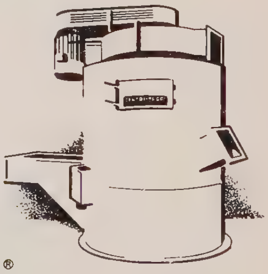

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YOU'RE LOOKING AT IT NOW.

Welcome home to the living fire

You get the friendly, cheerful glow that *only* a living fire can give—but no smoke! You also get a lot more. A modern open fire or room heater, burning solid smokeless fuel, will circulate warmth all around the room. Without leaving any chilly corners. This FANTOM open fire has a built in electric fan for forced draught. With high output back boiler it provides domestic hot water and runs five radiators.

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to smokeless zone problems

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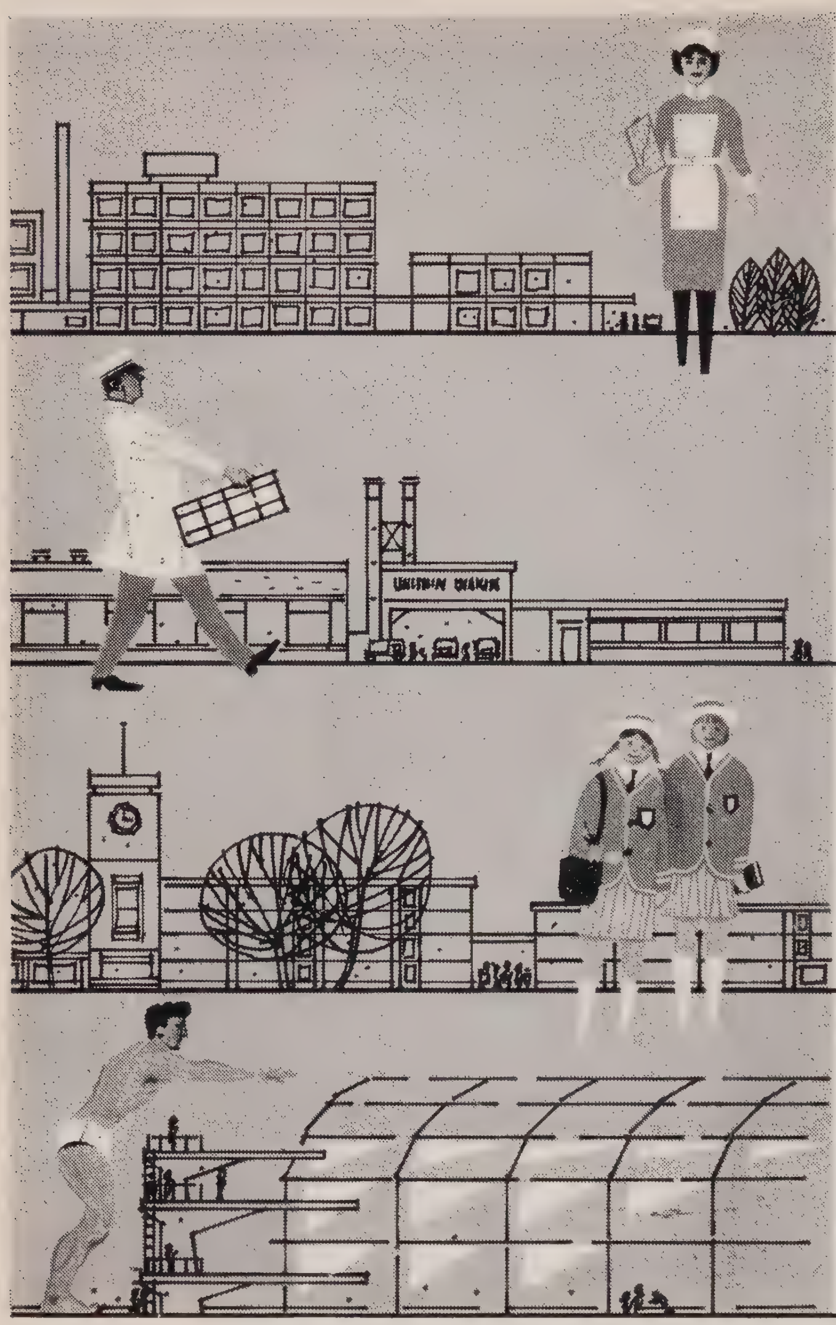
THE MODERN SMOKELESS COAL



where

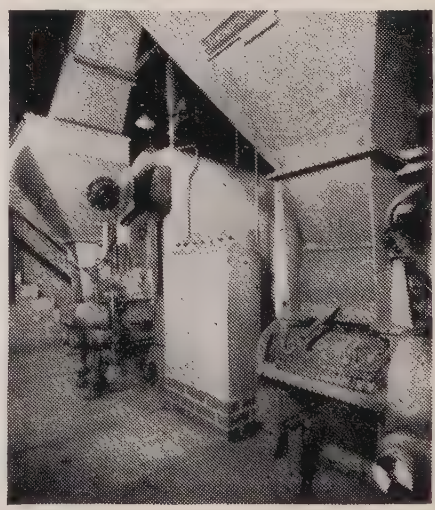
clean

air

is vital...

specify

THOMPSON-TRIUMPH STOKERS



Thompson-Triumph stokers for shell and sectional boilers burn low grade fuels efficiently and *smokelessly*. The Thompson-Triumph Ministoker has been developed for trouble-free automatic firing of sectional boilers and the smaller shell units. Thompson-Triumph Chain Grate Stokers are suitable for large shell boilers. Both types are robust in construction, simple in operation with automatic control and meet the requirements of the Clean Air Act. Full details from

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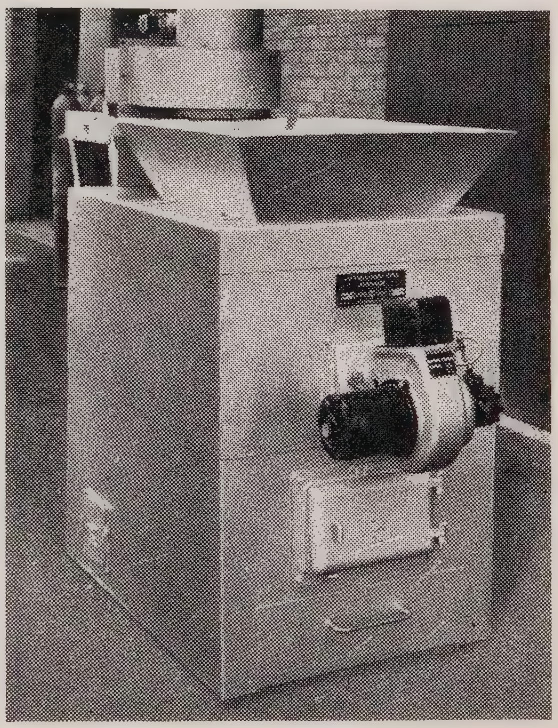
Specially designed for situations where limited space is a major problem. Available from 200-500 lb/hr according to type of waste.



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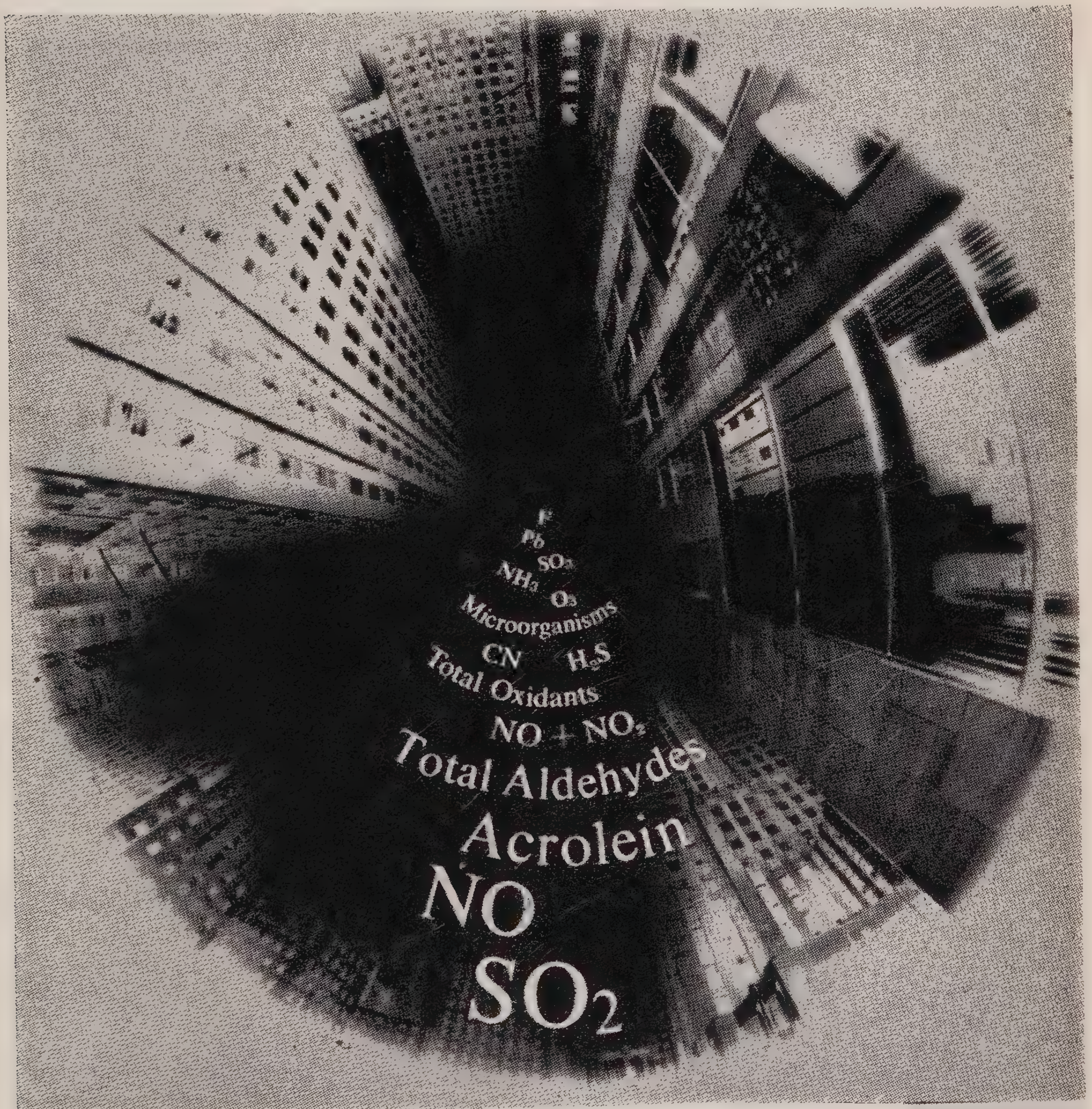
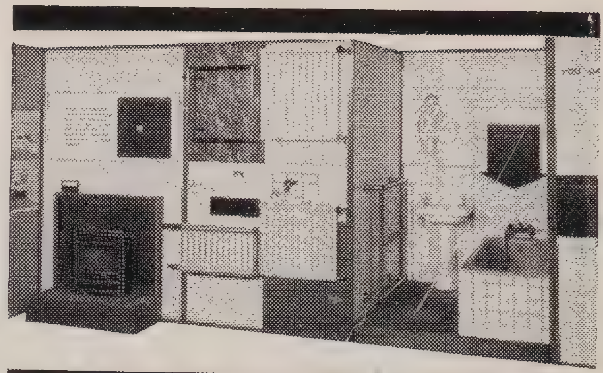


Consider these unique advantages of the AutoAnalyzer: ▨ *Specific*. Colorimetric analysis zeroes in on one pollutant only at a time. Employs specific absorption and chemistry of USPHS Procedures. ▨ *Flexible*. Interchangeable modules permit the determination of all parameters on one system. ▨ *Sensitive*. Detects and quantitates down to parts per billion. ▨ *Automatic*. Standardizes and calibrates itself. Unattended operation. ▨ *Mobile*. Portable racks or trailer laboratory may be used at many sites. ▨ *Graphic*. Permanent record within minutes of sampling is evidence for both industrial and governmental policing. *There's a much bigger story to tell. Write for the 12-page booklet "Specific Air Pollutants . . ."* **TECHNICON INSTRUMENTS CO. LTD., Hanworth Lane, Chertsey, Surrey. Tel. 01-655 4241**

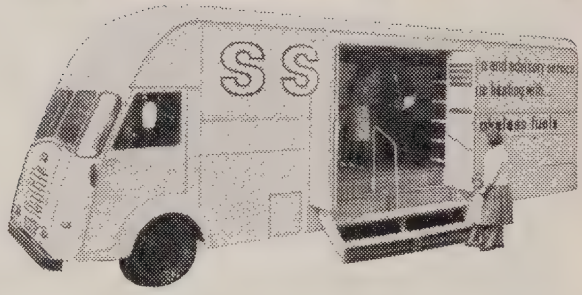
More ammunition for clean air campaigns

Local Authorities organising "Clean Air" campaigns, establishing Smoke Control Areas, organising House Improvement or Conversion schemes are invited to take full advantage of the services offered by the Solid Smokeless Fuels Federation, and available free of charge.



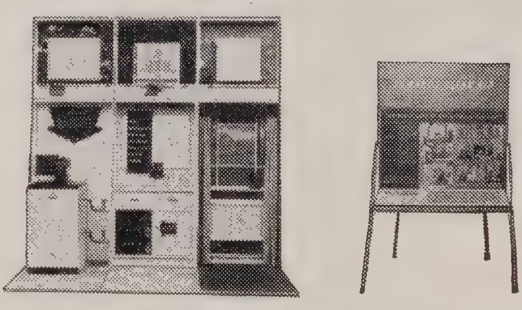
EXHIBITION

A complete pre-fabricated and self-contained "Clean Air" Exhibition: adaptable in size with one, two, three or four approved smokeless appliances under fire, and displays of the smokeless fuels available in the district.



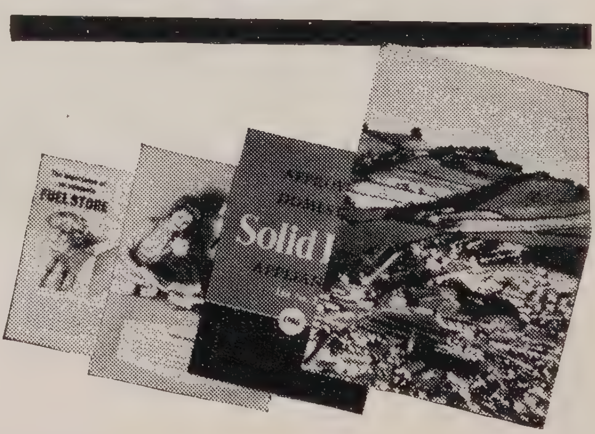
MOBILE UNITS

Manned with technical demonstrators, to advise and help residents in proposed or newly-formed Smoke Control Areas. They incorporate approved appliances under fire and a display of the solid smokeless fuels.



DISPLAYS

A range of portable units variously displaying instructional panels dealing with Clean Air and the Act, a typical central heating unit, fuel displays and literature displays.



LITERATURE

Informative literature is available free to Local Authorities explaining the Clean Air Act, and giving full information on solid smokeless fuels and the appliances.

For full details of S.S.F.F. Services and literature apply to:

SOLID SMOKELESS FUELS FEDERATION,
York House, Empire Way, Wembley, Middlesex

S53

MODERN HEATERS
for the MODERN HOME or OFFICE

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The Knightbridge range of heaters have been designed for incorporation within a normal building structure. Alternatively, installations for internal walls of breeze block structure require a surface mounted surround.

PRICE RANGE FROM
£19-3-10 – £25-4-5

All prices include Purchase Tax.

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"And tis my faith that
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the air it breathes" WORDSWORTH

You don't have to be a poet to appreciate the importance of clean fresh air.

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Oil is a clean fuel, providing clean combustion and contributing to a healthier environment. Oil is the lowest cost fuel for full automatic equipment.

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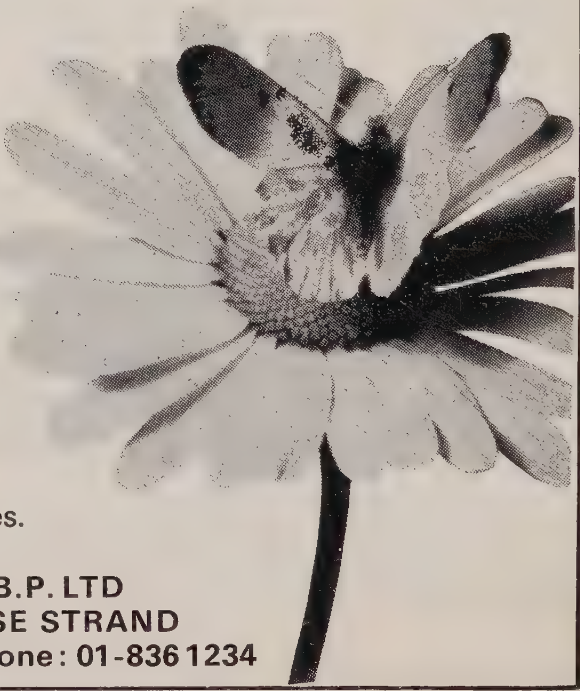

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a comprehensive range of :-

MECHANICAL
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OIL BURNERS

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with
associated fuel
and ash handling
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clean sweep

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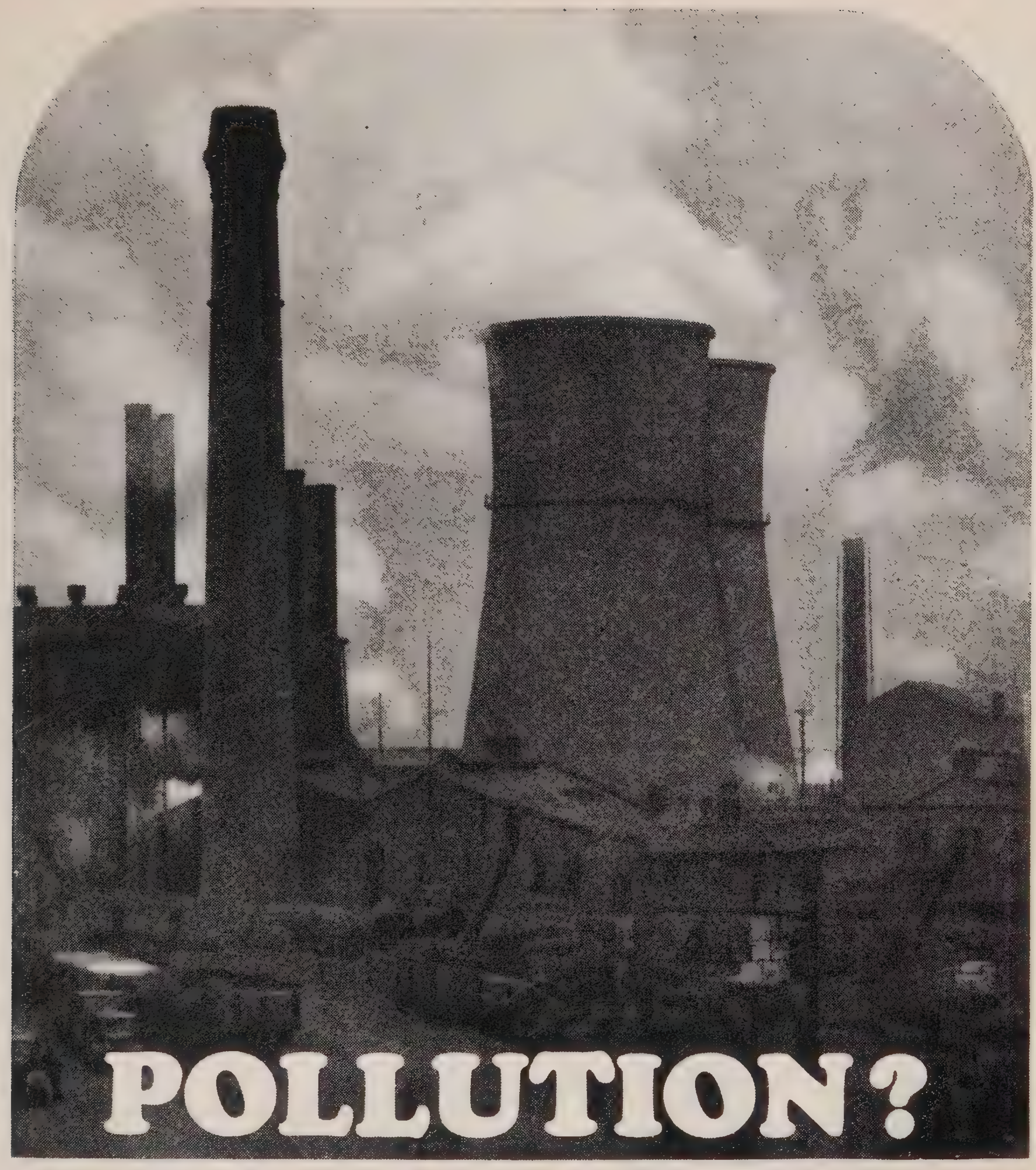
Parkray



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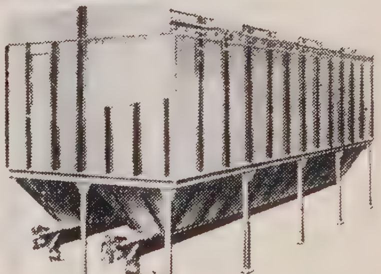
Mikro-Pulsaire!



For providing a dust-free atmosphere, nothing can beat the day-in-day-out economical efficiency of Mikro-Pulsaire. Fully automatic and self-cleaning – no internal moving parts. Nothing to shake. Nothing to wear out. Recovery efficiency above 99.99%. Far greater capacity. Lower installation costs. Filtering up to 425°F.

No wonder that people say, 'Mikro-Pulsaire is just a very special name for Clean Air!'

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MIKROPUL LIMITED

(Division of Pulverizing Machinery, Summit, New Jersey, USA)

Six million cubic feet of DIRTY gas every minute
CLEAN gas -thanks to Lodge-Cottrell

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S74

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NIFES–*National Industrial Fuel Efficiency Service*–offers a comprehensive and impartial service to industry on all problems connected with the use of energy, heat and power.

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REDUCE ENERGY AND PRODUCTION COSTS

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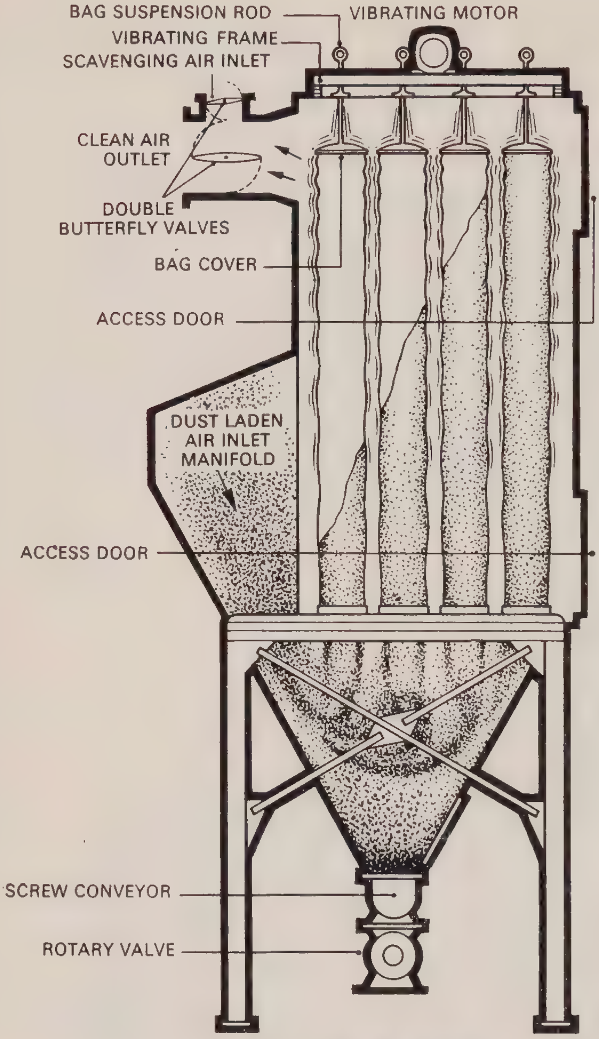

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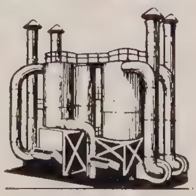
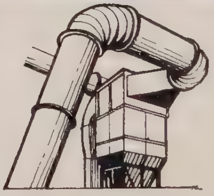
Detailed technical brochures dealing with bag filters and other types of dust collection and control plant such as electrical precipitators, wet arrestors and multi-cell cyclones can be had on request.

Section of Vibro Chamber Filter

99% efficiency – 0·005 microns and above	99% efficiency – 0·5 microns and above	99% efficiency – 3 microns and above	95% efficiency – 10 microns and above
 Electrical Precipitators	*Holmes are equipped to deal with any dust collection problem*	 Wet Arrestors	 Multi-cell Cyclones

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incinerators for
a wide variety of
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BURN YOUR WASTE AND REFUSE IN A HEENAN HORSFALL INCINERATOR with smoke eliminator

HYGIENIC · ECONOMICAL models available for all kinds of general service. Special designs to meet particular purposes.

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At modern coal-fired power stations, over £3,500,000 is spent on clean air measures —tall chimneys and dust extraction plant.

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CLEAN AIR YEAR BOOK

1967—1968

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NATIONAL SOCIETY FOR CLEAN AIR
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THIS FIRE...

is the heart-warming answer to the cold facts of the Clean Air Act. Now, no one has to give up a real living fire even in a smokeless zone. The FANTOM has been designed in conjunction with the National Coal Board.

...SAVES THIS MONEY: £5

AT LEAST ON EVERY APPLIANCE

ON EVERY HOUSE...

With an average installed cost of £15.10.0, the FANTOM is cheaper than any other domestic appliance designed and guaranteed to burn smokeless fuels.

IT LIGHTS QUICKLY

(gas ignition optional), recovers quickly and burns to a fine ash the full range of smokeless fuels, such as Sunbrite, Coalite, Gloco and Rexco.

CENTRAL HEATING TOO

The FANTOM provides 5 hot-water radiators and hot water for new or existing houses to the full Parker Morris standard more cheaply than any other system. Running costs: nil—as long as the fire's alight!

IT IS FIXED WITH...

Yes, with just two screws, it fits any standard 16″ fireplace with or without a back boiler in one-eighth the time it takes to fit any comparable smokeless fuel burning appliance.

THE SECRET...

The FANTOM uses a built-in electric fan to stream air up through the fuel, noiselessly, continuously, controllably. Switch on, and all smokeless fuels burn brightly: to give a glowing, *living* fire.

FANTOM

the power behind the living fire

Enquiries please, to:

Richard Baxendale & Sons Ltd., Bamber Bridge, Preston, Lancs

CLEAN AIR PROGRESS

Review for 1966–7

IT had been feared that the economic situation, with its enforced reduction in expenditure in re-equipment and development in fuel-burning practice in both industry and the home, might have slowed down progress to cleaner air. There may have been some such effect in industry, but this is difficult to ascertain. On the domestic side, however, the smoke control area programme has made better progress during the past year than in other recent years. The number of new smoke control areas (in operation, confirmed or submitted) over the past three years (ending on 31 March in each case) was:

1965	207
1966	228
1967	301

The number of premises in smoke control areas has now passed the 3 million mark. The regional figures are given in a table with the detailed smoke control area information on page 40. It will be seen that the lead is retained by the Greater London region, where over 61 per cent of its premises are now covered by smoke control.

This improved progress, though it is still slower than it should or need be, has been helped by the Ministry of Housing and Local Government in pressing the "laggard" authorities to take action, and by the issue of a Circular (25/66) on new conversion grant arrangements, details of which are given on page 32.

On the adverse side mention must be made of the serious concern felt by many local authorities by the sale of bituminous coal in smoke control areas and the difficulties encountered in preventing this technically legal but socially reprehensible practice. (See *Smokeless Air*, Summer, 1967, p.213.)

A Private Member's Bill on air pollution was introduced in the House of Commons by Robert Edwards, M.P., and attracted much attention. It was later withdrawn, but it is understood that a revised version, including amendments to the Clean Air Act, may be introduced in the House at the next session, with support from the Government.

Sir Hugh Beaver

The clean air movement suffered the loss, in January, 1967, of Sir Hugh Beaver, whose outstanding leadership of the Government Committee on Air Pollution in 1953 led to its forceful report and to the passing of the Clean Air Act. Sir Hugh died at his Sussex home at the age of 76. A fuller appreciation appeared in *Smokeless Air*, Spring, 1967.

The International Congress

A major event during the year was the International Clean Air Congress held in London from 4 to 7 October, 1966. It was the first congress of the new International Union of Air Pollution Prevention Associations, for whom it was organized by the National Society as one of the founder-members. 1,264 delegates, including 340 from overseas countries, attended. 91 papers were presented and have been published in volume form as the *Proceedings, Part I.* Part II of the Proceedings has been published subsequently as a separate volume, and contains the reports of the rapporteurs, addresses, and discussions.

At a meeting of the Executive Committee of the Union, held in London during the congress, it was agreed that the next international congress should be in Washington, D.C., in 1970. Under the constitution of the Union the President and Secretary are nominated by the new host association, and the election has now been confirmed of Dr. C. E. Barthel, Jr. as the new President, and Arnold Arch, as the new Hon. Secretary.

Other Meetings

Other meetings and conferences related to air pollution during the year included a symposium on District Heating, organized in London by the Institution of Heating and Ventilating Engineers in March 1967. An international congress at the Hague, organized by the Royal Society of Health, included a session on air pollution. In the United States a National Conference on Air Pollution, under the auspices of the Public Health Service, took place in Washington in December, 1966, with an attendance of over 3,000. In May, 1967, the Air Pollution Control Association held its annual conference at Cleveland, Ohio, with an attendance of about 2,000. At this conference the Society's Richard Beatty Mellon Award was presented to the Director of the National Society for Clean Air, Arnold Marsh.

Road Vehicle Pollution

Particular attention has been given to this problem during the year. The Government report, *Cars for Cities*, contains an important section on the subject, and was published very shortly before the report by the Technical Committee of the NSCA on *Air Pollution from Road Vehicles*.

Much interest was aroused by developments in electric-battery vehicles and by reports of progress being made in the development of new types of battery that would extend the range and performance of electric vehicles. Work on modification to petrol engines, to reduce emissions of polluting fumes and gases, has been reported and has been stimulated by the new standards being enforced in the U.S.A.

Clean Air and the Whole Environment

The closer co-ordination of all activities concerned with the maintenance, restoration, and defence of man's environment as a whole, is a subject of great potential importance on which attention has recently been focussed both in the United States and in Britain. Air pollution is of course an important factor in this concept. A report from a U.S. Presidential Committee, published from the White House, entitled *The Quality of the Environment*, was reviewed in *Smokeless Air* (Summer, 1966), and in this country there was a report by an Environmental Committee of the North West Economic Planning Council in which the same broad examination of the environment was made. Although air pollution is a specialized study, and requires its own disciplines, greater cooperation and co-ordination with other movements also defending the environment appears to be a matter to be closely studied.

THE LAW RELATING TO AIR POLLUTION

The principal legislation in Great Britain (excluding Northern Ireland) is the Clean Air Act, 1956. This supersedes the Public Health (Smoke Abatement) Act, 1926, which in its turn amended the smoke abatement section of the Public Health Act, 1875. References to earlier legislation are given in the chronological history of air pollution on another page.

Several amendments to the domestic (smoke control area) provisions of the Clean Air Act were included in the Housing Act, 1964. A note on these changes is given below.

A Clean Air (Northern Ireland) Act received the Royal Assent in 1964. Its provisions are largely identical with the 1956 Act.

Fumes and gases from industrial

processes are controlled through the Alkali &c., Works Act, 1906, administered by the Alkali Inspectorate. Under the Clean Air Act smoke, dust and grit emission from certain scheduled processes are also the responsibility of the Inspectorate. (See the section, following, on the Alkali Act.)

Apart from the Clean Air Act it should be noted that action may be taken with regard to smoke or other nuisance from air pollution under common law procedure, and this can be used to secure both damages and an injunction.

In addition to a number of older Local Acts containing smoke abatement provisions, over 50 local authorities obtained powers, between 1946 and 1956, for the establishment of smokeless zones and/or the optional prior approval of new industrial fuel-burning installations. Local authorities may continue to use these provisions unless the relevant sections of their Acts should be repealed, as may be done under section 35 of the Clean Air Act. A number of local authorities have also established smokeless housing estates, where smokelessness is ensured not by legislation but by conditions of tenancy.

Pollution from road vehicles is not controlled under any of the clean air legislation, but through the Road Traffic Act and Regulations, a description of which is given on a following page.

The Clean Air Act in Outline

For a fuller digest of the contents of the Act reference may be made to the *Summary of the Clean Air Act,* published by the Society. The following outline necessarily omits much detail of importance.

SS.1 and 2 deal with **Dark Smoke,** defined as shade No. 2 of the Ringelmann scale. Regulations have been issued on the extent to which dark smoke is permitted. It is an offence to emit dark smoke beyond these limits, and the only defences that may be used are specified: lighting up from a cold furnace; unavoidable failure of plant; unavoidable use of unsuitable fuel; and a combination of any of these. For seven years (from 5th July, 1956) there was a further defence that it was not possible to complete necessary alterations to plant.

(Stat. Inst. 1958. No. 498). (Scotland: Stat. Inst. 1958. No. 1933 (S.106)).

S.3 requires all **New Furnaces,** other than domestic (i.e. less than 55,000 B.Th.U. per hour) to be as smokeless as practicable. Local authorities *must* be notified of new installations and *may* be asked to give prior approval.

S.4 relates to regulations for the installation of **Smoke Density Recorders,** etc.

SS.5 to 9 require all furnaces to use means to minimize **Grit and Dust from Furnaces:** large *new* furnaces (burning more than 1 ton per hour) and all new pulverized fuel furnaces of any size to secure prior approval of grit arresting equipment to be installed; regulations for measuring and recording grit and dust; supplying local authorities with information about such records; and putting outdoor furnaces on the same footing as those in buildings.

S.10, **Height of Chimneys,** gives powers to local authorities to reject plans for new buildings if chimneys are not sufficiently high.

SS.11 to 15 concern **Smoke Control Areas,** which may be established by local authorities under an Order requiring Ministerial approval. Smoke control areas may be entirely smokeless (as with smokeless zones) or may make certain exemptions or impose special conditions. For domestic (and charitable, etc.) premises local authorities may make a grant towards the cost of converting grates, etc., to appliances suitable for smokeless use. The authority may recover part of the grant from the central Exchequer, and normally the cost of conversion will be owner or occupier and local authority 30 per cent each, Exchequer, 40 per cent.

In a case of smoke emission in a control area it is a defence if an authorized fuel only was being burned. Regulations defining authorized fuels have been issued.

(Stat. Inst. 1956, No. 2023).

(The Housing Act, 1964, S.95, amends certain provisions of the above sections).

S.16 deals with **Smoke Nuisances** from smoke other than dark smoke. In this case it is an offence only when a nuisance to inhabitants of the neighbourhood has been proved.

S.17 concerns *processes* that are scheduled as **Special Cases** by Ministerial regulation, and in which the control of pollution will be by the Alkali Inspectorate and not the local authorities. The processes include those that are or will be registered under the Alkali Act. With respect to smoke, grit and dust the Minister may transfer control of particular *premises*, or part of them, to a local authority.

(Stat. Inst. 1958, No. 497). (Scotland: Stat. Inst. 1958, No. 1932 (S.105).)

S.18 on **Colliery Spoilbanks,** requires the owner of a coal or shale mine or quarry to use all practicable means to prevent the combustion of deposited refuse, and to minimize any smoke or fumes that may occur.

S.19 is to the effect that **Railway Engines** are subject to dark smoke emission control as if they were buildings. The owner of the engine must also use any practicable means there may be to minimize smoke emission.

S.20 is to the effect that dark smoke from **Vessels** in specified waters shall be controlled as such smoke from buildings. This applies to vessels in any water not navigable to a sea-going ship and in other defined waters.

(Stat. Inst. 1958, No. 878). (Scotland: Stat. Inst. 1958, No. 1934 (S.107).)

S.21 gives a local authority power of **Exemption** from action under the Act, for a stated period, for research or investigations relevant to the problem of air pollution.

S.22 requires a local authority to report smoke emissions from **Crown Premises** to the Minister responsible for the premises. He must then inquire into the case and if there is cause for complaint must use all practicable means to prevent or minimize the emission or abate the nuisance.

S.23 provides for the setting up of a **Clear Air Council,** with the Minister of Housing, Local Government and Welsh Affairs as its Chairman, to review progress and obtain advice on air pollution matters. There is also a similar Clean Air Council for Scotland.

(Stat. Inst. 1957, No. 766).

S.24 states that **Building Byelaws** "may require the provision in new buildings of such arrangements for heating or cooking as are calculated to prevent as far as practicable the emission of smoke." (A model byelaw for this purpose has now been issued but is being revised to meet the provisions of the Housing Act, 1964).

S.25 gives local authorities power to undertake or contribute towards the cost of **Research and Publicity,** etc.

S.26 relates to the improper **Disclosure of Information** obtained as a result of administering the Act.

S.27. **Penalties.** In summary, and in each case quoting the maximum penalty: *Dark Smoke,* private dwellings, £10; other cases, £100 for each offence (e.g. each day). *New furnaces not smokeless:* £10. *Smoke emission in control areas:* £10 for each offence. *Disclosure of Information:* £100 or 3 months imprisonment, or both. *Other offences:* £100.

S.28 relates to **Authorization of Works.**

S.29 on **Enforcement,** refers to the powers of local authorities.

S.30 on **Notification of Offences** is procedural.

SS.31, 32 and 33 deal with administrative and legal matters.

S.34 on **Interpretation,** gives the

meaning to be applied to a number of words and phrases used in the Act.

S.35 deals with **Repeals and Transitions.**

S.36 excludes **Northern Ireland** from the provisions of the Act.

S.37 gives the **Short Title** and commencement of the Act.

The First Schedule relates to the confirmation and coming into operation of orders of local authorities under section 11.

The Second Schedule consists of amendments to the Alkali &c., Works Regulation Act, 1906.

The Third Schedule gives modifications of, and provisions supplementary to, Public Health Acts, etc.

The Fourth Schedule lists the enactments repealed by the new Act.

The Housing Act, 1964

The Clean Air Act, 1956, was amended in respect to dwellings (sections 11 to 15) by section 95 of the Housing Act, 1964. This section is divided into nine subsections, which may be summarized as follows:

(1) A new dwelling is defined as one begun on or after 16 August, 1964. (2) and (3) Local authorities may designate as unsuitable, appliances for which suitable fuels are not fully available in the area. (4) and (5) give local authorities discretionary powers in relation to payment of grants in certain special cases. (6) (7) and (8) provide for the extra cost of discretionary in case of hardship, etc., to be shared between the local authority and the Exchequer. (9) provides for grant to be paid for means for the ignition of solid fuels even if "works" are not involved, which was not previously the case.

For a full description and commentary on these amendments reference should be made to the Ministry of Housing circular No. 46/64.

Clean Air Act Regulations

Authorized Fuels

The Smoke Control Areas (Authorized Fuels) Regulations came into force on 31st December, 1956. These relate to section II of the Clean Air Act, which provides for a defence in the case of smoke emission from a building in a smoke control area if it is proved that the smoke "was not caused by the use of any fuel other than an authorized fuel." The fuels authorized in the regulations are: anthracite, briquetted fuels carbonized in the process of manufacture, coke, electricity, gas, low temperature carbonization fuels and low volatile steam coals.

Liquid Fuels

The Building Regulations described below do not include appliances for the use of liquid fuels, nor do the Authorized Fuel Regulations include liquid fuel as an authorized fuel. The Smoke Control Areas (Exempted Fireplaces) Order, 1957, exempts from control under section 11 of the Clean Air Act fireplaces designed or adapted for the combustion of liquid fuel, "provided they are so installed, maintained and operated as to minimize the emission of smoke." Under section II the Minister may make Orders exempting from control in smoke control areas any fireplace that he is satisfied can be used without producing any substantial quantity of smoke when burning other than an authorized fuel. The Order therefore allows for the use of oil-burning appliances in smoke control areas, and also has the effect of allowing such appliances to be included among those permitted under the Building Regulations.

It should be noted that although the use of oil is thus permitted in smoke control areas and under the Building Regulations, oil remains a non-authorized fuel, so that in case of smoke emission from an oil-burning installation in a smoke control area the authorized fuel defence could not be used.

Mechanical Stokers

The Smoke Control Areas (Exempted Fireplaces) Order, 1959, exempts mechanical stokers from smoke control area orders in the following terms: "Fireplaces, other than fireplaces fired by pulverized fuel, constructed on or after the 31st day of December, 1956, and equipped with mechanical stokers, or adapted on or after that date for use with such stokers," on condition that "the fireplace shall be so installed, maintained and operated as to minimize the emission of smoke. No fuel shall be used other than that for which the mechanical stoker was designed."

Appliances

The Exempted Fireplaces Order, 1959, also exempts two specified appliances: the Solid Fuel Ductair Unit, manufactured by Radiation Ltd., and the Fulgora Slow Combustion Stove, manufactured by Fulgora Stoves, Ltd., on condition that they "shall be so installed, maintained and operated as to minimize the emission of smoke, and in any case in accordance with the manufacturers' instructions." In the case of the Fulgora Stove it is also a condition that "no fuel shall be used other than wood waste in clean condition." A new, 1966, Order exempts the Hounsell Sawdust Burning Stove with similar conditions.

Firelighting by Sticks and Paper

Circular 28/60 of the Ministry of Housing and Local Government states that while gas remains the best and most convenient means of lighting solid smokeless fuels in smoke control areas, there will be houses which cannot be supplied with gas at a reasonable cost and also some people may object to having gas at all. For the present, therefore, the Minister accepts that the small amount of smoke caused in this way must be accepted in the general interest of making progress with the creation of smoke control areas.

" The Minister thinks that legal cover for the use of sticks and paper for lighting fires can best be given by the use in smoke control orders of the power of exemption in section 11(3) of the Clean Air Act, 1956. Local authorities could give an exemption in general terms extending to fireplaces in any building or separately occupied parts of a building which is not supplied with town gas; or alternatively, they could give a specific exemption to named individual premises. Either type of exemption should be subject to a condition to secure that it would have effect only where authorized fuels or kindling sticks and paper were being used ".

The Minister asks that such exemption should be included where it is apparent that some buildings or parts of buildings will remain without a gas supply. He also asks that if a local authority should decide not to include an exemption along these lines in such a case, then they should give an explanation when submitting the order for confirmation.

Building Regulations

Prevention of Smoke Emission

The Building Regulations, 1965, include a section, M2, relating to the prevention of emission of smoke. This supersedes the earlier byelaw on the subject. The full text of the section is:

M2. In any building (other than a building erected under former control) there shall not be installed for the purposes of heating or cooking in that or any other building any appliance which discharges the products of combustion into the atmosphere, unless that appliance is designed to burn as fuel either gas, coke, or anthracite:

Provided that nothing in this regulation shall prohibit the installation of:

(i) a furnace which complies with Section 3 of the Clean Air Act 1956; or

(ii) any appliance of a class exempted conditionally or unconditionally from the provisions of Section 11 of the Clean Air Act 1956 (which relates to smoke control areas) by any order for the time being in force under subsection (4) of that section; or

(iii) a solid fuel appliance with a bottom grate unsuitable for burning coke or anthracite but designed so as to be capable of use with an alternative bottom grate which is suitable for burning such fuel.

Dark Smoke Regulations

In Statutory Instrument 1958, No. 498, " The Dark Smoke (Permitted Periods) Regulations, 1958," the Minister of Housing and Local Government has made the regulations required for the operation of Section 1 (2) of the Clean Air Act. The Regulations permit the following:

(i) Not more than 10 minutes dark smoke emission in the aggregate from any chimney in any period of 8 hours.

(ii) This permitted time extended to 14 minutes if soot blowing is carried out within the 8 hour period.

(iii) The 10 and 14 minutes to be extended for chimneys serving more than one furnace as follows:
A chimney serving 2 furnaces, 18 and 25 minutes respectively; a chimney serving 3 furnaces, 24 and 34 minutes respectively; a chimney serving 4 or more furnaces, 29 and 41 minutes respectively.

(iv) A continuous emission of dark smoke from the chimneys of factories (other than that caused by sootblowing) for a period not exceeding 4 minutes.

(v) The emission of black smoke up to 2 minutes in the aggregate in any period of 30 minutes.

The regulations apply to dark smoke from the chimneys of factories, shops, offices and railway engines, but not to dark smoke from the funnels of ships, for which separate regulations have been made, as set out below.

Dark Smoke (Permitted Periods) (Vessels) Regulations

These regulations, under s.1(2) of the Clean Air Act, are contained in Statutory Instrument 1958, No. 878. They specify the periods within which dark smoke is permitted from vessels in various classes of case, as detailed in the schedule below. The phrases in italics, "10 minutes in 2 hours", etc., mean that 10 minutes emission of dark smoke *in the aggregate* is permitted in any period of 2 hours.

Schedule—Classes of Case

1. Emissions from a forced draught oil-fired boiler furnace, or an oil engine. 10 *minutes in* 2 *hours.*

2. Emissions from a natural draught oil-fired boiler furnace (except in the cases falling within class 4 below). 10 *minutes in* 1 *hour.*

3. Emissions from a coal-fired boiler furnace:
   (*a*) when the vessel is not under way (except in the cases falling within class 4 below). 10 *minutes in* 1 *hour.*
   (*b*) when the vessel is under way. 20 *minutes in* 1 *hour.*

4. Emissions from a natural draught oil-fired boiler furnace or a coal-fired boiler furnace in the following cases:
   (*a*) a vessel with funnels shortened for the purpose of navigating the Manchester Ship Canal;
   (*b*) a tug not under way, but preparing to get under way or supplying power to other vessels or to shore installations;
   (*c*) a vessel not under way but using main power for the purpose of dredging, lifting, pumping or performing some other special operation for which the vessel is designed. 20 *minutes in* 1 *hour.*

5. Emissions from any other source. 5 *minutes in* 1 *hour.*

In addition, *continuous* dark smoke caused otherwise than by the soot-blowing of a water-tube boiler, shall not exceed:

(1) in the case of classes 1 and 2 above, 4 *minutes.*

(2) in the case of natural draught oil-

fired boiler furnaces in class 4, 10 *minutes.*

Further, in *no case* shall black smoke (Ringelmann 4) be emitted for more than 3 *minutes* in the aggregate in any period of 30 *minutes.*

The Alkali, etc., Works Regulation Act

The Alkali, etc., Works Regulation Act, 1906, consolidates and extends previous similar Acts, the first of which was passed in 1863.

The Act includes a schedule of chemical processes and a list of noxious or offensive gases. Since 1906, this schedule and list have been extended by Statutory Orders made under the Public Health (Smoke Abatement) Act, 1926 and the Alkali, etc., Works Regulation (Scotland) Act, 1951. Such orders were made in 1928, 1935, 1939, 1950, 1958, 1961, 1963 and 1966.

The essence of the Act lies in the requirements that (1) scheduled processes must be registered annually, (2) as a prior condition in the case of a first registration the scheduled process must be provided to the satisfaction of the Chief Inspector with the " best practicable means " for preventing the escape of noxious or offensive gases to the atmosphere and for rendering such gases harmless and inoffensive, (3) the " best practicable means " must thereafter be maintained in good and efficient working order and must be operated continuously, (4) in the case of certain processes, upper limits are specified for the concentration of total acidity in effluent gases which may be discharged to the atmosphere.

Provision is made for the setting up and maintenance of an inspectorate to administer the Act, and regulations are included relating to the registration and inspection of works, general procedure, penalties, etc. The Chief Inspectors are required to make an Annual Report to be laid before Parliament, relating to the work of the inspectorate.

Under the Clean Air Act, 1956, the provisions of the Alkali Act are extended to apply to smoke, dust and grit from premises controlled under the Act as they already do to noxious or offensive gases. Thus from 31st December, 1956 virtually all forms of air pollution from processes registered under the Alkali Act will be subject to control under that Act by the Alkali Inspectorate. Any other parts of a work are the responsibility of the local authority.

The Alkali, etc., Works Orders

The first four Orders dealt mainly with processes in the heavy chemical and related industries where noxious or offensive gases are the potential offenders. In an Order which came into operation on 1 June 1958 the Minister of Housing and Local Government further extended the Alkali Act by adding to the list of scheduled processes a number which are responsible principally for emissions of smoke, grit and dust. Among these processes are a number for the production of iron and steel, iron or steel melting processes, and some copper and aluminium processes. Gas and coke works, electricity works, coal fired producer gas plant and lime kilns and certain ceramic kilns fired by coal or oil were also added to the list together with sulphate reduction and caustic soda plant and certain types of chemical incinerators. The Order also made the appropriate additions to the list of noxious or offensive gases.

The 1961 Order deals with emissions from the processing of uranium, beryllium, selenium and their compounds. The 1963 Order is much more comprehensive and was prepared largely to take into account the major changes which have taken place in recent years in the heavy chemical and allied industries. It also covers the burning of scrap cable to remove the insulation. This is necessary because of the increasing amount of cable covered with polyvinyl-chloride, which, on burning, gives rise to hydrochloric acid, chlorides and possibly phosgene. The Order begins the policy of descheduling certain of the 1958 Order smoke processes.

The 1966 Order is important, for in addition to making a few minor alterations to the lists of scheduled works and noxious or offensive gases, it revokes all the earlier seven Orders and consolidates them in the 1966 Order. Thus, all the Alkali Acts and Orders since 1863 are consolidated in the 1906 Act and the 1966 Order.

Chimney Height

The effects of air pollution are proportionate to the concentration of the pollutants, and where pollution is unavoidable (which includes the products of combustion from any fuel, and in particular the gases from sulphur-bearing fuels) it is desirable to secure the greatest dispersion possible. Apart from the Alkali Act, which requires that emitted noxious and offensive gases shall be rendered harmless and inoffensive, the only legislation to promote the dispersion of chimney gases is Section 10 of the Clean Air Act, 1956. This controls the height of chimneys, other than those of residences, shops and offices. Plans submitted in accordance with building byelaws which show that it is proposed to erect a chimney, may be rejected unless the local authority is satisfied that the chimney will be of a height "sufficient to prevent so far as practicable the smoke grit dust and gases from becoming prejudicial to health or a nuisance".

The Act gives no definition of sufficient height, which depends on the circumstances of each case. Use has been made of various formulae for determining the required height. These formulae are of some complexity and more recently a simpler form of guide has been issued by the Ministry of Housing and Local Government. (Memorandum on Chimney Heights, H.M.S.O., 1963, 1s. 3d. net. Reprints of the nomograms on Permatrace are available from H.M.S.O. at a cost of 10s.)

The calculations required first take account of the amount of sulphur dioxide emitted per hour, and assume that the efflux velocity of the flue gases will not be less than that indicated for different types of installation. The guide then shows how the "uncorrected chimney height" may be calculated. This is the height appropriate for the relevant maximum rate of SO_2 emission when account has been taken of the neighbouring sources of pollution, the local background level of pollution, and the general character of the district. The uncorrected height is never less than 40 feet.

A key of five different types of district is given and by the use of nomograms the uncorrected chimney height for very small, small, medium and large installations is read off. If the uncorrected chimney height thus determined is not less than 2½ times the height of the building to which the chimney is attached, or any other building in the immediate vicinity, no further correction need be made. If however the uncorrected height is less than 2½ times the height of such buildings, a further correction has to be made. This correction is partly based on the ratio between the greatest length and height of the building (to the ridge), since this influences the effect of down-draughts.

On a further nomogram a line is taken from the uncorrected chimney height through a point representing the building height to a reference line. From here another line is drawn through a point representing the height of the building or its greatest length, whichever is lower, to a point indicating the final height. This is subject to any adjustment that may be necessary to ensure that the chimney top is never less than 10 feet above the ridge of the building, nor less than the uncorrected height.

The Working Party on Chimney Heights has been reconvened primarily to have another look at its advice to the Minister so far as it relates to very small installations, with a view to modifying the Memorandum. Difficulty has been experienced in its application to this class of furnaces. At the same time the opportunity is being taken to review the remainder of the Memorandum.

Grant Arrangements

A circular of the Ministry of Housing and Local Government (51/65) of June 1965 introduced important modifications to the grant arrangements in smoke control areas following the changes made in Circular 69/63. This followed the report on domestic fuel supplies and permitted grants to be made on openable stoves or room-heaters, and equivalent appliances using other fuels. Difficulties arise in the interpretation of what is "reasonably necessary" and are said to have involved both the local authorities and the department in a great deal of correspondence.

This circular has now been amended by Circular No. 25/66 to take account of new appliances, increases in costs and developments in the testing of electric storage heaters.

The circular lists the cost limits for various types of appliances. 19 items are listed as an appendix, and as they are of especial general interest the list is quoted in full below.

It is for the local authority to decide, within the appropriate cost level, what costs are reasonable in each case. The Minister will accept as qualifying for Exchequer contribution expenditure which is acceptable to the local authority and which falls within the limits shown in this list, but he will not normally accept any portion of the cost (excluding installation cost) which exceeds the stated limit.

It is pointed out that it remains a principle that facilities of a standard

Smoke Control Area Grants; Cost Limits for Various Appliances (Circular 25/66)

	£
Improved open fire (including integral gas ignition and, where necessary, deepening plate and bar)	6
Improved open fire (including integral gas ignition and, where necessary, deepening plate and bar) with boiler	17*
Underfloor draught fire and fan-assisted open fire	17
Underfloor draught fire and fan-assisted open fire with boiler	23*
Solid fuel room heater	26
Solid fuel room heater with boiler	36*
Gas room heater	24
Electric thermal storage heater	29
Oil room heater	16
Solid fuel cooker with boiler	60
Gas or electric cooker	35
Independent solid fuel boiler, **including installation**	25
Gas water heater (e.g. gas circulator and back boiler unit), **including installation**	25
Electric immersion water heater, **including installation**	15
Wash boiler, gas and electric	13
Gas poker, including flex and tap	2
Bottled gas igniter, if gas container is hired	3
Bottled gas igniter, including purchase of gas container	6
Electric kindler	8

* £2 may be added where

(i) it would be impossible or inadvisable to connect the existing boiler to the new space-heating appliance,

and

(ii) either

(*a*) the existing boiler is itself bower-barffed or made of stainless steel, copper, aluminium, bronze or other superior material,

or

(*b*) one of the above types is necessary to comply with local water bye-laws.

approximately equal to that of existing facilities should be provided, but that extra costs should not be incurred solely to provide higher standards. It is pointed out that the installation of a modern smokeless appliance in place of a coal-burning fireplace may incidentally provide a higher standard of heating, but that this will not preclude grant on the full payment.

A number of other matters are referred to, and a further appendix revises paragraph 26 of the Ministry's Memorandum on Smoke Control Areas, in which reference is made to the changes arising from S.95 of the Housing Act, 1965.

Road Traffic Pollution Law

The Statutory Regulations governing the emission of smoke or other forms of pollution from road vehicles are made by the Minister of Transport and Civil Aviation in exercise of the powers conferred on him by sections 3, 17, 30, and 111 of the Road Traffic Act, 1930 (20 & 21 Geo.5.c.43.).

The Regulations at present operative are known as "The Motor Vehicles (Construction and Use) Regulations 1966. (Statutory Instruments 1963, No. 1646)." Under Part IIA. of the Regulations, governing the construction, weight and equipment of vehicles, Regulation 22 (Emission of smoke or vapour), states: "Every motor vehicle shall be so constructed that no avoidable smoke or visible vapour is emitted therefrom."

Regulation 23(1) includes compression ignition (i.e., diesel) engines in the words "motor vehicles", and (2) requires excess fuel devices to be so fitted that they cannot be operated by a person while he is being carried by the vehicle, unless (a) such a device cannot be used after the engine has been started, or (b) does not cause any increase in smoke or visible vapour.

Part III of the Regulations governs the Use of Vehicles. Regulation 83 states:

"No person shall use or cause or permit to be used on a road any motor vehicle from which any smoke, visible vapour, grit, sparks, ashes, cinders, or oily substance is emitted if the emission thereof causes or is likely to cause damage to any property of injury to any person who is actually at the time or who reasonably may be expected on the road, or is likely to cause danger to any such person as aforesaid".

Regulation 84 relates to the use of the excess fuel device, and requires such a device to be so maintained that it does not cause the engine to be supplied with excess fuel while the vehicle is in motion on a road; nor allows any person so to use it.

(*The operation of the regulations, by Ministry of Transport officers, and by the Police, is discussed, together with the technical factors involved, in a paper by H. D. Fawell, Ministry of Transport, published in the NSCA Harrogate Conference,* 1964, *Proceedings.*)

Warren Spring

The Work of the Warren Spring Laboratory of the Ministry of Technology on the Investigation of Air Pollution and its Abatement

Warren Spring Laboratory carries out research on the nature and extent of air pollution, and on its prevention and abatement, in order to provide technical information necessary for the administration of clean air legislation, for town planning and the location of industry, and for research into the effects of air pollution.

The National Survey of Air Pollution

The National Survey, devised by Warren Spring Laboratory, is planned statistically to enable valid conclusions to be drawn on the incidence of air pollution in urban areas throughout the country, while restricting observations to a reasonably small number of sites. Some 120 towns were chosen for the purpose and each agreed to make daily measurements of smoke and sulphur dioxide in the following five types of district, in so far as examples are to be found in each town:

(*a*) Residential area with a high population density, such as old terrace housing.

(*b*) Residential area with a low population density, such as a housing estate or suburb.
(*c*) Industrial area.
(*d*) Commercial area, with central heating predominating.
(*e*) Smoke control area, which may be any of the above types.

Observations are also being made at a number of sites in the depth of the country to give background information. All sites for the survey were chosen by the local authority in collaboration with Warren Spring Laboratory, and on 1 April 1967 observations for this statistically-planned part of the Survey were being made by 120 authorities operating 420 instruments and a further 33 authorities in the area administered by the Greater London Council operating 207 instruments.

In addition, a further total of 238 local authorities and others were making daily observations of smoke and sulphur dioxide at 559 sites. These measurements are being made on the initiative of the authorities concerned, and primarily for their own local purposes, but they form a second part of the National Survey and comparison of these results with the national averages established by the first part of the survey will be of great value.

Under part three of the Survey a further 94 sites were operated by 48 authorities in rural areas, to provide data on drift of pollution and background information.

Other Measurements of Air Pollution

In addition to the daily smoke and sulphur dioxide observations, many local authorities and other bodies make monthly measurements of grit-and-dust-fall, using the British Standard Deposit Gauge, and of the rate of reaction of sulphur compounds with lead dioxide. Warren Spring Laboratory continues to give advice and help in connection with such measurements.

Standing Conference of Co-operating Bodies

All local authorities and other organizations who make measurements of air pollution, either as part of the National Survey or purely for their own local purposes, and who submit the data regularly to Warren Spring Laboratory for publication, are entitled to send representatives to the Standing Conference of Co-operating Bodies. This Conference meets twice yearly to discuss matters of interest connected with air pollution. Other bodies may do so on payment of a subscription. At 31 March, 1967, 453 bodies had appointed representatives to the Conference.

Publication of Results

All data submitted to the Laboratory are collated, and summaries are published in a Monthly Bulletin, one section of which deals with daily measurements of smoke and sulphur dioxide, and another with monthly measurements made with the deposit gauge and the lead dioxide instrument. A third section of the Bulletin contains abstracts of papers and other information on air pollution that have appeared in the period concerned. Annual Summaries of the data are also published.

These Bulletins and Annual Summaries are available on request to all concerned with problems of air pollution.

In addition, a series of Reports on the Investigation of Atmospheric Pollution published by H.M. Stationery Office, gives analyses of these results and an account of research on the measurement and abatement of air pollution.

The last in this series, the 32nd Report, published this year, brings the position up to date, and gives, in addition, an account of the changes in the administrative arrangements.

Instruments

Work by the Laboratory on the calibration of the daily smoke filter and on the accuracy of the daily hydrogen peroxide method for sulphur dioxide has now led to British Standard Specifications on both methods and to their acceptance internationally by the Organization for Economic

Co-operation and Development (OECD). Effort is now concentrated on the development of a reasonably cheap automatic SO_2-recorder.

Town Planning Studies

In the past few years it has become increasingly apparent that while it is quite impracticable to control the amounts of sulphur oxides in the air by limiting their emission (as is done for smoke under the Clean Air Act) it is, nevertheless, possible to make great improvements by taking full advantage of natural dispersion processes. This can be done by the proper design of chimneys in relation to buildings and the proper siting of the various types of residential district in relation to each other and to industrial installations. A great deal of effort is being devoted to obtaining sufficient knowledge of the distribution and spread of pollution in urban areas to enable town planners to do their work satisfactorily from an air pollution point of view.

An intensive investigation is in progress on the effect of the turbulence in the wake of tower blocks of offices or flats on the pollution in the neighbourhood. Another concerns the spacing of such blocks from each other and from separate large industrial emitters. A third has to do with the design of the chimney on the tower block itself.

The more general problem of the design of chimneys in relation to buildings, to avoid flue gases being entrained in the turbulent wake, is being studied by means of a furnace and chimney that can be erected at various positions in relation to the large laboratory block at Warren Spring Laboratory. Parallel tests are being carried out by the National Physical Laboratory on corresponding models in a wind tunnel. This investigation has been undertaken at the request of the Federation of British Industries.

The spread of pollution in a town from a single emitter is being investigated at Cambridge using tracers emitted from a low chimney.

While the National Survey provides a great deal of information on the distribution of pollution in urban areas this is being supplemented by special investigations. Thus a survey in Sheffield is being undertaken in cooperation with the Department of Geography of the University to examine the build-up and dispersion of pollution over the city. The effects of topography, weather conditions, and relation of industry to housing are being examined.

Removal of Sulphur Compounds from Flue gas

While it is recognized that it would be impracticable, economically and technically, to contemplate the universal application of methods of removing sulphur compounds from flue gas, it is considered that if a suitable process were available it might have limited but important applications. Work is now in progress on the possibility of abating the nuisance from one particularly troublesome type of emission.

The National Industrial Fuel Efficiency Service

The National Industrial Fuel Efficiency Service, formed in May, 1954, is a non-profit organization which offers industry, local authorities and commercial property owners practical help in the use of heat and power, whatever type of fuel is used.

N.I.F.E.S. services include Heat and Power Surveys, which show by precise measurement where waste occurs in factory premises and how it can be prevented. This service is also used in plant extension or development projects. Boiler house efficiency tests and methods of increasing the efficiency of steam-raising plant. Advice on improving the efficiency of heat-using process plant, furnaces and power plants. Regular service, designed to bring a factory or premises to a high degree of efficiency in the use of fuel and to maintain it at that level. Checks on space-heating systems and advice on insulation. Advice on the Clean Air Act requirements and the reduction of smoke and grit emission. N.I.F.E.S.

uses equipment specially designed by the British Coal Utilization Research Association as a basis for advice in grit emission cases. It is also used to test the operation and efficiency of grit arrestors which, under the Clean Air Act, are required to be properly maintained and used. A comprehensive series of training and refresher courses for boiler plant operators, works and plant engineers, and all those whose work is connected with fuel and steam-using plant. For the benefit of those who are unable to attend technical colleges, N.I.F.E.S. has a specially designed study course (arranged in conjunction with the College of Fuel Technology) leading to the City and Guilds of London Boiler Operator's Certificate.

All enquiries should be addressed to the appropriate Area Engineer at the address given in the Directory.

The Clean Air Case

A Synopsis for the Guidance of Speakers, Writers, Teachers, etc.

1. Historical Background. Growth of the air pollution problem and efforts to abate it, from 1273 to the present day. (*See History table.*)

2. Nature, Sources and Causes, Smoke: Due to incomplete combustion; consists of fine carbonaceous particles and tarry droplets. (For quantities produced, *see Table.*)

Gases: Sulphur dioxide the most harmful, especially when in association with smoke particles. Also carbon monoxide, and noxious gases and fumes from chemical processes. See the Society's Report on *Sulphur Dioxide as an Air Pollutant.*

Grit and dust: Mainly from industrial sources, e.g., pulverized coal and high-draught furnaces.

3. Extent and Behaviour of Pollution. Measurement of floating and deposited impurities, sulphur dioxide, and of light values. The Investigation under the Warren Spring Laboratory (*q.v.*)

4. Fog. Natural and smoke fogs, their formation and characteristics. The London, 1952, 1962, and other lethal smogs.

5. Effects. *Health:* Effects on respiratory system. Effects due to obstruction of natural light. Possible relationship with lung cancer. Psychological and social consequences of life in smoke-ridden environment. Effects of smog are the result of infrequent high concentration of pollution, whereas the insidious action of " normal " pollution takes place continuously.

Plant Life: Principal factors injurious to vegetation are: loss of sunlight, blocking of stomata by deposits, direct attack by chemicals, acidification of soil. Indirect effect on grazing animals through deterioration of herbage, or of poisoning in the case of fluoride pollution.

Materials: Corrosion or erosion of metals, stone, fabrics, leather, etc.

Visibility: Loss of visibility due to smoke haze and smog affecting air and surface transport.

Costs: See information on page 52

6. Prevention. *Industrial Smoke:* calls for correct equipment, maintenance and operation of plant. Value of mechanical stoking. Uses of oil, gas, electricity and smokeless solid fuel. Importance of training and certification of stokers. Instrumentation, smoke alarms, etc. Need for all-round fuel efficiency. *Dust and grit:* Use of arrestors of appropriate types: cyclones, wet washing, electrostatic precipitators. *Sulphur:* removal by coal washing, flue gas-washing and other possible means. Importance of high chimneys and emission velocity.

Domestic: By use of smokeless fuels—gas, electricity, oil or solid. *See article describing the types of solid smokeless fuel.* Need for efficient appliances. Central and district heating, whole-house warming, off-peak electrical methods, etc. Smoke control areas, purpose and national programme.

Railways and Roads: Use of diesels and electricity for the former. Need for efficient combustion and good maintenance in road vehicles, possible development of catalytic afterburners and other devices.

7. Policy, Law, etc. The present law —Clean Air Act, 1956, Public Health Act, 1936, local Acts, Road Traffic Act, 1930, Alkali, etc., Works Regulation Act, 1906, and Orders, etc. The Beaver Report and its proposals. Responsibilities of local authorities and central Government. Smokeless zones and smoke control areas. Work of the Warren Spring Laboratory, Alkali Inspectorate and other organizations. Educational and publicity work of the National Society for Clean Air.

(*See also the new NSCA booklet "Clean Air Lecture Notes"*, 1*s.* 6*d.*)

Better things are electric

Issued by the Electricity Council, England & Wales

Estimates of Air Pollution in Great Britain in 1965

Tables prepared by Dr. Albert Parker, C.B.E.

(1) From the Main Uses of Fuel

Figures in millions of tons to the nearest 0·1m. tons for quantities of fuel, smoke, and grit and dust, and to the nearest 0·01m. tons for sulphur dioxide)

Fuel and Class of Consumer	*Quantity of Fuel*	*Pollutants Discharged*		
		Smoke	*Grit and Dust*	*Sulphur Dioxide*
Coal				
Domestic (including miners' coal)	27·3	0·9	0·1	0·70
Electricity works	69·3	small	0·3	2·12
Railways	2·8	0·1	small	0·08
Industrial and miscellaneous ..	38·8	0·1	0·2(*a*)	1·12
Coke ovens	25·7	small	small	0·09
Gas works	18·0	small	small	0·13
	181·9			
Coke (excluding consumption in gas works and blast furnaces) ..				
Domestic, including other manufactured solid smokeless fuels ..	6·3	nil	small	0·14
Industrial and miscellaneous ..	6·9	nil	small	0·17
	—	1·1	0·6	4·55
Oil				
Domestic				
Kerosene and domestic fuel oils	2·1	very small	nil	0·01
Industrial				
Kerosene, gas/diesel and fuel oils, and creosote-pitch	36·6(*b*)	small	nil	1·76
Road and Rail Transport				
Motor spirit, gas/diesel and fuel oils	15·5	small	nil	0·07
Marine Craft				
Gas/diesel and fuel oils ..	1·1	small	nil	0·04
	55·3(*c*)	small	nil	1·88
Total for coal and oil	—	1·1	0·6	6·43

(*a*) Excluding grit and dust emission, estimated at about 4m. tons, from industrial processes other than steam raising.

(*b*) The amount of 36·6m. tons of oil is equivalent in heating value to about 62m. tons of coal, which if used for the same purposes would have produced about 0·2m. tons of smoke, 0·2m. tons of grit and dust, and about 1·7m. tons of sulphur dioxide.

(*c*) The amount of 55·3m. tons of oil is equivalent to about 94m. tons of coal, so that the coal equivalent of the coal and oil consumed (excluding air transport) in Great Britain in 1965 was about 276m. tons.

The estimates of pollution from road vehicles in the following table were made by Dr. Parker on the basis of the most recent analyses of the exhaust gases with the engines operating under various conditions.

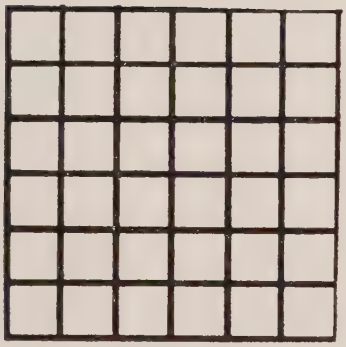
The estimated quantity of carbon monoxide discharged into the air from the other industrial and domestic uses of all fuels in 1965 is about 12 million tons of which nearly one half was from domestic heating appliances.

(2) From Road Vehicles

Consumption of Motor Spirit	10·739m. tons
Consumption of Derv fuel	3·844m. tons

Pollutant	*Quantity in Million Tons from* *Petrol Engines*	*Diesel Engines*
Carbon monoxide	5·0	0·08
Hydrocarbons	0·25	0·016
Aldehydes	0·01	0·003
Oxides of nitrogren	0·17	0·05
Sulphur dioxide	0·02	0·03

The Ringelmann Chart



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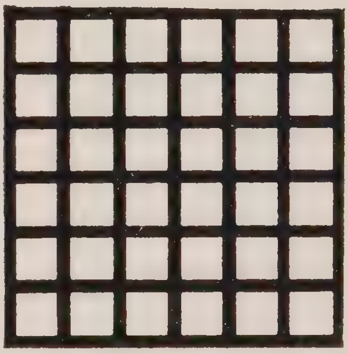

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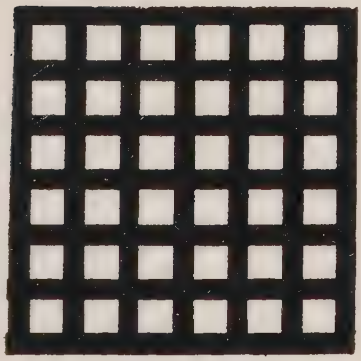

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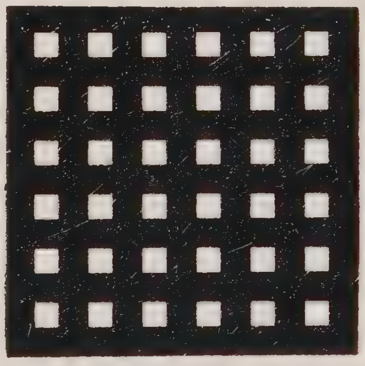


No. 4

The Ringelmann chart, by means of which dark smoke is defined in the Clean Air Act, consists of the above four shades, which when viewed from a sufficient distance appear as varying tones of grey. They show 20, 40, 60, and 80 per cent blackness. The charts are 4 in. square, and are viewed, in line with the smoke being observed, at about 50 ft. from the observer. A full specification for production and use is given in B.S. 2742C. The standard chart is published in Britain by Charles Griffin & Co. Ltd., 42 Drury Lane, London, W.C.2. A pocket-size facsimile the "Microringelmann" is published by the U.S. journal "Power" (McGraw-Hill). Copies of both charts may be purchased from the Society. (See Guide to Publications, following, for prices.)

SMOKE CONTROL AREAS

Programmes and Progress

The following lists contain the names of Local Authorities in the "Black Areas" with (1) *the target date for completion of their Smoke Control Programme,* (2) *the final acreage,* (3) *acreage in operation on June* 1, 1967, (4) *total number of premises in operation on June* 1, 1967.

The figures have been compiled as accurately as possible from the records of the Ministry of Housing and Local Government, from "Smoke Control 1962-1966" *and from information received by the Society directly from many Local Authorities regarding target dates. Where no figures are given in columns* 1 *and* 2, *this means that the Authority in question has not submitted a programme to the Minister of Housing and Local Government.*

The figures in italics refer to acres and premises in smokeless zones established by some Local Authorities before the Clean Air Act and in areas where smoke control operates through tenancy agreements.

NORTHERN

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.)* 1.6.67	*4* *Premises (In Oper.)* 1.6.67
Tyneside and Wearside				
Gateshead C.B.	1980	4,677	448	3,256
Newcastle C.B.	1980	11,401	4,060	15,702
South Shields C.B.	1980	—	—	—
Sunderland C.B.	1980	9,013	1,440	20,313
Tynemouth C.B.	1987	5,000	—	—
Jarrow B.	1975	1,500	170	1,190
Wallsend B.	1975	3,544	1,173	4,069
Blaydon U.D.	—	—	291	735
Boldon U.D.	1977	—	—	—
Felling U.D.	1976	—	425	2,813
Gosforth U.D.	1970	—	—	—
Hebburn U.D.	1974	1,563	556	1,136
Longbenton U.D.	—	—	—	—
Newburn U.D.	1980	4,648	585	2,623
Ryton U.D.	—	—	—	—
Whickham U.D.	1977	6,213	773	3,230
Teeside				
Darlington C.B.	—	—	244	1,590
Middlesbrough C.B.	—	—	3,003	14,419
Hartlepool C.B.	1975	6,584	1,030	3,705
Stockton-on-Tees B.	—	6,084	—	—
Thornaby-on-Tees B.	1971	1,993	982	532
Billingham U.D.	1971	2,092	1,186	5,140
Eston U.D.	1972	3,000	38	494

YORKSHIRE

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.)* 1.6.67	*4* *Premises (In Oper.)* 1.6.67
West Riding (North)				
Bradford C.B.	1971/2	25,503	9,919 *1,481*	36,339 *14,284*
Dewsbury C.B.	1975	6,720	567	3,842
Halifax C.B.	1977	14,081	2,424	13,063

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.)* 1.6.67	*4* *Premises (In Oper.)* 1.6.67
West Riding (North) (continued)				
Huddersfield C.B.	1980	14,147	13,092	12,452
Leeds C.B.	1975	40,613	7,939	41,577
Wakefield C.B.	1977	5,800	1,230	2,950
Batley B.	1977	4,461	930	2,585
Brighouse B.	1975	7,875	2,205	4,126
Castleford B.	—	—	34	507
Keighley B.	1970	3,238	2,700	10,352
Morley B.	1977	9,994	3,593	4,192
Ossett B.	1968	3,332	1,453	3,881
Pontefract B.	1982	4,865	611	802
Pudsey B.	1980	5,205	279	1,145
Spenborough B.	1972/3	8,600	2,019	4,974
Aireborough U.D.	1970	6,856	3,111	5,631
Baildon U.D.	1970	2,830	1,413	2,222
Bingley U.D.	1970	11,018	2,329	6,343
Denholme U.D.	—	—	—	—
Elland U.D.	1974	5,951	30	423
Featherstone U.D.	—	—	—	—
Heckmondwike U.D.	1972	697	383	1,328
Horbory U.D.	1971	1,280	335	1,340
Horsforth U.D.	1970	2,706	1,007	3,969
Knottingley U.D.	1969	2,837	710	2,481
Mirfield U.D.	1979	—	532	1,565
Normanton U.D.	1979	3,061	—	—
Queensbury and Shelf U.D.	1975	2,795	524	1,086
Rothwell U.D.	1974	10,695	973	2,058
Shipley U.D.	1970	2,184	1,685	7,813
Sowerby Bridge U.D.	1973	4,000	452	1,069
Stanley U.D.	—	5,169	428	564
West Riding (South)				
Barnsley C.B.	—	7,811	414	954
Doncaster C.B.	1975	8,371	1,682	8,492
Rotherham C.B.	1973	8,000	1,126	5,660
Sheffield C.B.	1972	39,598	16,059	53,811
Connisborough U.D.	1983	—	—	—
Cudworth U.D.	1975	1,746	—	—
Darfield U.D.	—	—	—	—
Darton U.D.	1972	4,718	63	59
Dearne U.D.	1987	—	—	—
Dodworth U.D.	—	—	—	—
Hoyland Nether U.D.	—	—	—	—
Mexborough U.D.	1975	—	—	—
Rawmarsh U.D.	—	—	—	—
Royston U.D.	—	—	—	—
Swinton U.D.	1980	—	153	1,326
Wath-upon-Dearne U.D.	1972	2,665	455	639
Wombwell U.D.	—	—	—	—
Worsborough U.D.	1976	1,660	—	—
Rotherham R.D.	—	—	—	—
East Riding				
Kingston-upon-Hull C.B.	1971	12,000	4,848	27,682

NORTH WESTERN

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.)* 1.6.67	*4* *Premises (In Oper.)* 1.6.67
South Lancashire and North-East Cheshire				
Bolton C.B.	1972	5,401	1,701	13,237
			86	*1,050*
Bury C.B.	1971	2,168	1,038	3,900
Manchester C.B.	1970	27,255	10,608	56,194
			523	*4,764*
Oldham C.B.	1981	6,392	1,627	5,505
Rochdale C.B.	1972	9,556	4,030	11,488
			67	*337*
Salford C.B.	1970	5,202	2,212	19,020
			57	*1,859*
Stockport C.B.	1975	8,439	1,126	8,737
Wigan C.B.	1975	5,083	1,256	3,074
Altrincham B.	1973	3,519	45	547
Ashton-under-Lyne B.	1976	4,146	610	4,038
Dukinfield B.	—	1,725	1,284	1,776
Eccles B.	1970	3,417	2,147	4,354
Farnworth B.	1978	1,504	200	940
Heywood B.	1970	8,342	2,599	5,812
Hyde B.	1975	4,170	1,982	6,944
Leigh B.	1971	6,359	475	3,302
Middleton B.	1981	5,170	1,213	7,445
Mossley B.	1970	1,200	54	541
Prestwich B.	—	2,420	2,279	3,150
Radcliffe B.	—	4,915	477	843
Sale B.	1972	3,628	2,389	9,748
Stalybridge B.	1975	3,030	587	2,741
Stretford B.	1970	3,530	1,463	8,827
Swinton and Pendlebury B.	1978	3,363	749	3,787
Abram U.D.	—	—	—	—
Aspull U.D.	—	—	—	—
Atherton U.D.	1974	2,289	966	1,050
Audenshaw U.D.	1973	1,241	659	1,047
Blackrod U.D.	—	—	—	—
Bredbury and Romily U.D.	1977	688	566	2,126
Chadderton U.D.	1969	3,013	2,121	7,112
Cheadle and Gatley U.D.	1968	5,285	4,075	12,816
Crompton U.D.	1975	2,865	419	1,316
Denton U.D.	1969	2,592	1,907	11,244
Droylesden U.D.	1974	1,245	772	3,660
Failsworth U.D.	1975	1,663	281	2,670
Golborne U.D.	1975	5,765	—	—
Hindley U.D.	1979	2,612	225	999
Horwich U.D.	—	—	—	—
Ince in Makerfield U.D.	—	—	—	—
Irlam U.D.	1974	4,717	748	2,541
Kearsley U.D.	1980	1,720	11	84
Lees U.D.	—	—	—	—
Little Lever U.D.	—	808	—	—
Royton U.D.	1973	2,149	202	312
Tottington U.D.	—	2,544	—	—
Tyldesley U.D.	1980	5,174	—	—
Urmston U.D.	1972	3,944	1,025	4,192
Westhoughton U.D.	1980	5,834	120	607

	1 Target Date	*2* Final Acreage	*3* Acreage (In Oper.) 1.6.67	*4* Premises (In Oper.) 1.6.67
South Lancashire and North-East Cheshire (continued)				
Whitefield U.D.	1968	3,386	3,087	3,914
Worsley U.D.	1973	7,240	502	3,091
Central Lancashire				
Blackburn C.B.	1978	8,088	712	5,963
Burnley C.B.	1971	4,695	1,297	7,917
Preston C.B.	1975	6,357	1,951 *176*	13,022 *1,918*
Accrington B.	1975/80	4,418	—	—
Colne B.	1976	817	143	1,396
Darwen B.	1980	—	279	572
Nelson B.	1972	—	160	591
Barrowford U.D.	1975	—	—	—
Brierfield U.D.	1974	—	—	—
Church U.D.	1980	528	226	997
Clayton-le-Moors U.D.	—	1,060	—	—
Fulwood U.D.	1977	3,164	—	—
Great Harwood U.D.	1975	—	—	—
Oswaldtwistle U.D.	—	—	—	—
Padiham U.D.	1973	976	523	1,674
Rishton U.D.	1987	1,087	—	—
Merseyside				
Birkenhead C.B.	1979	8,043	2,768	5,685
Bootle C.B.	1975	3,054	1,073	5,672
Liverpool C.B.	1972	27,818	12,837	64,470
St. Helens C.B.	1975	8,865	138	1,778
Wallasey C.B.	—	5,961	4,436	19,408
Warrington C.B.	1972	4,639	832	7,205
Bebington B.	1980	2,220	718	4,907
Ellesmere Port B.	1977	3,724	866	4,707
Widnes B.	1975	4,500	1,938	5,001
Ashton-in-Makerfield U.D.	—	—	—	—
Haydock U.D.	—	—	—	—
Huyton-with-Roby U.D.	1970	3,054	953	3,645
Kirkby U.D.	1965	—	1,947	10,938
Litherland U.D.	—	1,180	—	—
Newton-le-Willows U.D.	1978	2,800	152	1,068
Prescot U.D.	1976	748	124	1,152
Runcorn U.D.	1970	3,116	845	2,628
MIDLANDS				
Derby, Nottingham and Chesterfield				
Derby C.B.	1977	8,000	870	6,443
Nottingham C.B.	1975	18,364	2,444 *125*	10,039 *2,000*
Chesterfield B.	1975	8,472	1,202	4,943
Ilkeston B.	1980	3,017	—	—
Mansfield B.	1980	7,009	955	2,229
Alfreton U.D.	—	5,023	—	—
Arnold U.D.	1981	—	86	377
Beeston and Stapleford U.D.	1974	6,468	3,794	8,729

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.)* 1.6.67	*4* *Premises (In Oper.)* 1.6.67
Derby, Nottingham and Chesterfield (**continued**)				
Bolsover U.D.	—	4,326	86	167
Carlton U.D.	1975	4,018	46	332
Dronfield U.D.	1975	4,567	428	3,700
Eastwood U.D.	—	—	—	—
Hucknall U.D.	—	4,029	—	—
Kirby-in-Ashfield U.D.	—	—	—	—
Long Eaton U.D.	1980	3,559	13	112
			57	*750*
Mansfield Woodhouse U.D.	1988	—	—	—
Staveley U.D.	1976	6,504	—	—
Sutton-in-Ashfield U.D.	1982	165	353	2,114
West Bridgford U.D.	—	3,045	—	—
Basford R.D.	—	—	—	—
Chesterfield R.D.	1972	29,000	2,296	6,245
North Midlands				
Leicester C.B.	1975	16,990	3,484	21,601
West Midlands				
Birmingham C.B.	1974	51,147	7,800	55,074
			203	*1,387*
Coventry C.B.	—	19,171	4,695	17,309
			30	*232*
Dudley C.B.	1980	13,151	4,612	20,823
Walsall C.B.	1980	8,777	1,203	2,829
Warley C.B.	—	5,804	837	6,142
West Bromwich C.B.	1987	10,298	623	10,851
Wolverhampton C.B.	1986	—	2,920	11,844
Halesowen B.	1971	5,247	1,082	4,839
Nuneaton B.	1978	11,767	2,896	4,037
Solihull B.	1989	13,645	3,293	4,934
Stourbridge B.	1975	4,000	1,221	4,744
Sutton Coldfield B.	1979	13,978	892	3,872
Aldridge—Brownhills U.D.	—	9,284	872	8,031
Bedworth U.D.	—	—	—	—
Coseley U.D.	—	—	—	—
Darlaston U.D.	—	—	52	512
Willenhall U.D.	1972	2,834	417	3,049
Potteries				
Stoke-on-Trent C.B.	1975	21,209	5,904	9,142
Newcastle-under-Lyne B.	1980	8,882	2,593	5,706
Kidsgrove U.D.	1979/80	4,095	61	596
SOUTH WEST				
Bristol				
Bristol C.B.	1980	26,345	5,051	18,105
LONDON				
Greater London Boroughs				
City of London (completed)	1955	677	677	21,700
Barking	—	8,449	5,616	41,728
Barnet	1976	22,124	7,386	40,078
Bexley	1975	14,986	1,818	9,254

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.)* 1.6.67	*4* *Premises (In Oper.)* 1.6.67
Greater London Boroughs (continued)				
Brent	1971	10,924	4,868	32,624
Bromley	1977	39,293	4,778	23,601
Camden	1968	5,365	3,886	74,042
Croydon	1975	23,812	4,027	33,363
Ealing	1971	13,708	7,174	54,376
Enfield	1970	20,060	12,830	44,380
Greenwich	1970	11,724	7,072	47,567
Hackney	1967	4,815	4,543	58,776
Hammersmith	1967	3,995	3,990	74,831
Haringey	1968	7,490	6,304	78,329
Harrow	1975	12,555	2,093	17,974
Havering	1974	29,110	7,288	33,444
Hillingdon	1976	27,259	10,253	26,294
Hounslow	1970	14,469	7,553	30,690
Islington	1969	3,679	2,005	54,159
Kensington and Chelsea (Royal)	1971	2,952	1,868	48,123
Kingston-upon-Thames (Royal)	1978	9,279	2,197	12,870
Lambeth	1976	6,738	1,894	35,463
Lewisham	1968	8,581	7,494	79,437
Merton	1975	9,379	4,190	20,630
Newham	1978	8,986	688	3,337
Redbridge	1970	3,947	6,831	33,995
Richmond-upon-Thames ..	1970	13,645	7,282	38,549
Southwark	1975	7,117	3,101	38,754
Sutton	1975	10,729	3,112	20,427
Tower Hamlets	1968	4,876	3,627	48,964
Waltham Forest	1975	9,804	3,920	33,300
Wandsworth	1970	8,628	4,631	40,474
Westminster (City)	1968	5,333	4,649	108,710
Outer London				
Dartford	—	—	—	—
Epsom and Ewell	—	—	—	—

SCOTLAND

Total Acreage and Premises in Operation at 1.6.67

	Acreage	*Premises*		*Acreage*	*Premises*
Barrhead	150	678	Kilmarnock	77	281
Clydebank	1,204	5,421	Lanark County ..	683	2,222
Coatbridge	1,196	6,308	Midlothian County ..	1,070	371
Dumbarton	1,089	3,997	Milngavie	281	4
Dundee	4,616	18,930	Motherwell	759	4,566
East Kilbride ..	2,518	7,357	Paisley	3,279	12,841
Edinburgh	5,544	21,712	Renfrew Burgh ..	536	1,404
Falkirk	1,485	3,085	Rutherglen	376	2,245
Fife County	300	2,877	Stirling County ..	2,003	5,327
Glasgow	16,942	99,731	West Lothian ..	2,384	15
Grangemouth ..	351	1,720			

WALES

Total Acreage and Premises in Operation at 1.6.67

	Acreage	*Premises*		*Acreage*	*Premises*
Connah's Quay U.D.	53	—	Pontypridd	8,141	12,717
Mold U.D. (No. 1) ..	45	328		(By arrangement, only low volatile coal to be sold in the area)	
Newport C.B. ..	43	651			
Wrexham U.D. (No. 1)	51	437			

Smoke Control Areas

Summary of Progress as at 30 June 1967

(1) *Region*	(2) *No. of acres covered by smoke control orders confirmed or awaiting decision*	(3) *Percentage* of total black area acreage in the region so covered*	(4) *No. of premises covered by smoke control orders confirmed or awaiting decision*	(5) *Percentage of total black area premises in the region so covered*
Northern	22,230	17.74	104,470	18·89
Yorkshire and Humberside	121,460	32·25	410,980	35·19
East Midlands	37,180	12·98	122,555	23·94
Greater London	180,920	55·32	1,615,525	61.21
North Western	124,560	31·05	583,695	34·28
West Midlands	63,690	25·58	271,465	25·82
South Western	7,200	27·33	26,650	17·89
Totals (black areas)	557,240	31.41	3,135,340	40·32
Outside black areas (all parts)	96,699		333,928	
GRAND TOTALS	653,939		3,469,268	

*The percentage shown in columns (3) and (5) above are percentages of the *total* acreage and of the *total* number of premises in the black areas concerned. In practice it may not always be necessary for the whole of a black area authority's district to be covered by smoke control orders (e.g. there may be some areas of open country).

Note

Statistics in respect of Wales and Monmouthshire are no longer included.

Local Authorities Outside the Black Areas

Local Authorities outside the Black Areas who have Smoke Control Areas in operation, with total acreages and premises to 1.6.67

	Acreage	*Premises*
Aylesbury B.	275	535
Basildon U.D.	2,355	16,707
Bedford B.	1,358	5,510
Blaby R.D.	267	1,850
Blackburn R.D.	260	413
Brentwood U.D.	188	2,327
Burton-on-Trent C.B.	180	1,548
Cambridge B.	411	1,453
Chatham B.	887	4,632
Cheltenham B.	840	1,493
Cheshunt U.D.	794	4,115
Connah's Quay (Flintshire) U.D.	53	—
Corby U.D.	441	3,566
Crawley U.D.	3,679	11,198
Crewe B.	478	2,115
Elstree R.D.	500	2,877

	Acreage	*Premises*
Exeter C.B.	1,599	5,222
Gillingham B.	3,760	7,641
Glanford Brigg R.D.	1,526	1,860
Gloucester C.B.	85	672
Grantham B.	1,043	3,260
Gravesend B.	686	1,381
Harlow U.D.	5,889	17,291
Hazel Grove and Bramhall U.D.	272	1,156
Hemel Hempstead B.	2,417	5,654
High Wycombe B.	2,252	6,591
Hornchurch U.D.	4,620	22,698
Kingswood U.D.	12	130
Lancaster B.	2,579	2,642
Leamington Spa B.	841	2,414
Leek U.D.	96	18

	Acreage	*Premises*
Letchworth U.D.	1,103	3,611
Lincoln C.B.	1,389	408
Luton C.B.	1,716	9,673
Marple U.D.	69	405
Northfleet U.D.	393	1,317
Old Fletton U.D.	123	962
Oxford C.B.	1,343	3,849
Peterborough B.	354	1,924
Potters Bar U.D.	35	416
Reading C.B.	1,339	5,926
Rochester B.	1,012	3,122
Saddleworth U.D.	227	413
Scunthorpe B.	2,659	7,232
Seisdon R.D.	57	24
Shrewsbury B.	379	582
Skipton U.D.	687	1,334
Slough B.	2,497	10,038
Southampton C.B.	263	2,468
South East Derbyshire R.D.	28	288
Southport C.B.	67	250
Staines U.D.	6,207	10,124
Thurrock U.D.	3,061	8,669
Todmorden B.	271	2,232
Warwick B.	126	1,083
Watford B.	887	3,612
Wellington U.D.	232	11
Wetherby R.D.	157	670
Whitley Bay B.	110	797
Wilmslow U.D.	257	1,803
Winsford U.D.	453	4,404
Wortley R.D.	460	1,368

Major Smog Disasters

The word " smog " was first used by the late Dr. H. A. Des Vœux, founder-president of the N.S.A.S., in 1905, to denote the combination of smoke and natural fog that in urban areas may have disastrous consequences. There are numerous cases of smog conditions resulting in a marked rise in mortality and morbidity from respiratory disorders and consequential cardiac failure. Among these incidents are the following.

London, 1873. Rise in bronchitis deaths, compared with the previous week, of 268.

London, 1880. Rise in bronchitis deaths, compared with the previous week, of 692.

London, 1891. Rise in bronchitis deaths, compared with the previous week, of 572.

Glasgow, 1909. Average number of deaths in the 3 weeks prior to the fog were 57 per week. During 5 weeks of fog or haze the deaths per week were: 138, 233, 171, 198 and 137.

Manchester and Salford, 1930-31. In December, with no fog, there were 137 respiratory disease deaths. In January there were 9 days heavy fog and 592 deaths.

Meuse Valley, 1930. 60 deaths attributed to fog, the death rate rising to 10·5 times the normal. Many cattle had to be slaughtered.

London, 1948. Bronchitis deaths in week before fog, 73; in the week of fog, 148.

Donora, U.S.A., 1948. 18 deaths in a population of 14,000. 42 per cent of the population were estimated to have suffered from illness.

London, 1952. The fog developed on Friday, 5th December and continued until 8th December. Estimated total of 4,000 deaths in the Greater London area. In the Administrative County only deaths from bronchitis rose from 121 to 872, and from heart and circulatory diseases, from 318 to 801.

London, 1956. 1,000 additional deaths attributed to January fog in the Greater London area. (*B.M.J.*, 31 *March*, 1956.)

London, 1962—Fog in London and other areas, December 3-7, with similarities to the 1952 fog, but with 750 additional deaths as compared with 4,000.

Principal References

Mortality and Morbidity during the London Fog of December, 1952. Ministry of Health Public Health Report No. 95. (This report contains a section on " Previous Fog Incidents," with a statistical appendix for those in London.)

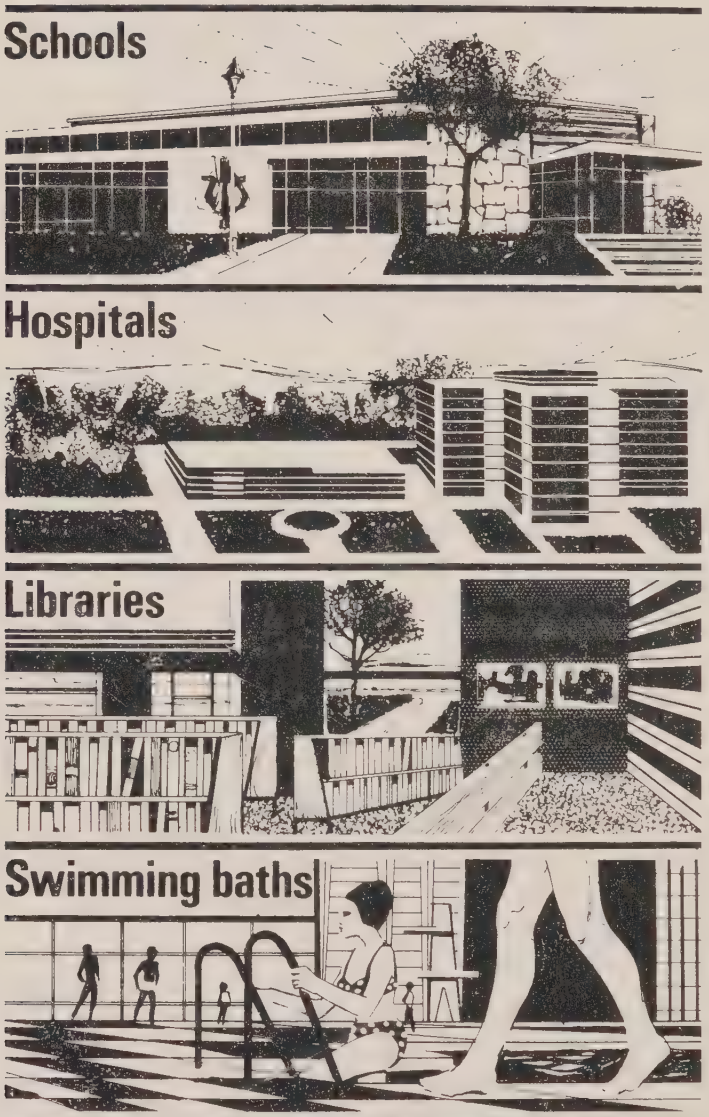
Les Problèmes de Pollution de l'Atmosphère, Batta, Firket and Leclerc, Liége, 1937.

Air Pollution in Donora, Pa. Public Health Bulletin, No. 306, Federal Security Agency, Public Health Service, Washington.

The Cover Photo—This photograph, reproduced from a colour print by Professor R. S. Scorer, has been chosen to illustrate the need for smoke control in towns not included in the "black areas".

More and more local authorities are heating with

REXCO Smokeless coal



clean, economical REXCO

REXCO is made from top grade coal—officially approved for use in Smokeless Zones. It's economical too—because it's long-burning and stores well. It's easy to light and to maintain.

REXCO is easily ordered from coal merchants or the National Coal Board.

For further advice contact:
National Carbonising Company Ltd. Mansfield, Notts. Telephone Mansfield 22357
Scottish Rexco Ltd. Comrie's Colliery, Oakley, Fife. Telephone Saline 345/6

It's Time to Change to Rexco — It's Smokeless!

Solid Smokeless Fuels

The earliest reference to the use of special equipment to produce coke from coal is in 1759. At Throckly, on the River Tyne, "Beehive" ovens were then in use. Although reference to coke occurred frequently before that year, no details of the methods of making it are known and "Beehive" ovens may well have been used long before 1759.

Today, solid smokeless fuels are made from many different processes, coke ovens, continuous vertical retorts, by low temperature carbonization processes, by mild heat treatment and by the new fluidized char process and developments are taking place to further improve the quality of solid smokeless fuels.

All solid smokeless fuels are manufactured for specific purposes—for use in blast furnaces, foundry cupolas and for the domestic market. The fuels vary according to the quality and type of coal from which they are made and the method of carbonization. Certain of the domestic fuels are manufactured to a British Standard Specification and are carefully graded in size to ensure their suitability for a wide range of domestic appliances.

The authorized domestic solid smokeless fuels are as follows:

Anthracite

Anthracite is obtained mainly from South Wales and is characterized by its hard and bright appearance and is distinguished by its high carbon and low volatile content.

It is a suitable fuel for room heaters, boilers and cookers in which it will burn for many hours without attention. The small sizes of Anthracite peas, beans or grains, are used on gravity feed boilers.

Low Volatile Steam Coal

There are two categories of Low Volatile Steam Coal:

(a) Welsh Dry Steam Coal, which differs only slightly from Anthracite, from visual inspection. It has a relatively high carbon content although its volatile content is slightly higher than Anthracite. It is suitable for use in room-heaters, boilers and cookers.

(b) A low volatile coal with a slightly higher volatile content than the Welsh Dry Steam Coal is suitsuitable for use in open fires. It has a high bulk density and the replenishment of the fire need not be so frequent as with lighter fuels. This fuel known as **Lovol** is mainly available in South Wales and the West of England.

Phurnacite

Phurnacite is carbonized ovoids made from specially selected and prepared Welsh Dry Steam Coals.

Most of the volatile content is removed during the manufacturing process. The resulting smokeless ovoids burn for long periods without attention, are completely free of stone or shale and are suitable for use in room heaters, boilers and cookers.

The ovoids are extremely hard so that breakage and the formation of "fines" during transit is unlikely.

Barnsley Burnbrite

This fuel is manufactured in coke ovens from specially selected prepared coal at a lower temperature and for a shorter period than other products from coke ovens and is suitable for the improved open fire. Smaller sizes can be burned in room heaters, boilers and cookers.

Barnsley Burnbrite is available in London, the Midlands, North Western, South Yorkshire Areas and parts of Scotland.

Gloco and Sebrite

These fuels are produced to a British Standard Specification by the carbonization of selected coal and are carefully prepared for use in open fires which are specified for use with coke and preferable fitted with gas ignition. These fuels will not burn in old fashioned grates.

Gas Coke manufactured in continuous vertical retorts also comes within this category and is suitable for use on the open fire.

Smaller sizes of these fuels are suitable for roomheaters, boilers and cookers.

Sebrite is manufactured by the South Eastern and Eastern Gas Boards and is available only in South East England.

Sunbrite

Sunbrite a British Standard Specification fuel is a hard coke produced by the carbonization of selected coals at a high temperature in coke ovens. It is carefully prepared and selected for domestic heating appliances.

It is manufactured by the National Coal Board, the Steel Companies and the Independent Coke Producers.

Sunbrite is suitable for use in room heaters, boilers and cookers, fires with under-floor primary air for combustion and fan-assisted open fires.

Cleanglow and Phimax

These fuels are produced by different area gas boards in continuous vertical retorts from specially selected coals. Cleanglow is available in most parts of the country though Phimax is only available in the North West.

Cleanglow and Phimax are suitable for use on the open fire, are easy to ignite and burn with a flame.

Coalite and Rexco

Coalite and Rexco are manufactured from two different low temperature carbonization processes. They burn with a cheerful flame, are easy to ignite and are very reactive fuels. They are suitable for open fires; smaller sizes are suitable for room heaters, boilers and cookers.

Homefire

Homefire is a six-sided briquette three inches in diameter and one and a quarter of an inch thick. It has much the density of coal and a very low ash content.

It is a reactive fuel burning with a bright flame and is produced by the National Coal Board at Coventry. This fuel is suitable for open fires and at present is available in parts of the Midlands, the North West and the London Area.

Roomheat

Roomheat is produced by a process similar to that of Homefire and is a cushion shaped briquette that burns with a long flame giving an attractive fire with low ash residual. It is manufactured by the National Coal Board at Markham near Doncaster. This fuel is suitable for room heaters and open fires.

Multiheat

Mild heat treatment briquettes being produced at the Crown Fuel Works in Cardiff. They have anthracite as a main constituent and are manufactured by the National Coal Board.

Multiheat briquettes are ovoid in shape, strong and dense. This fuel is designed for use in room heaters, boilers and the improved open fire and supplies are available mainly in the South of England and the South West.

The International Union of Air Pollution Prevention Associations

The International Union that has now been established consists of non-governmental organisations only. Its primary functions are to promote collaboration and the exchange of information on air pollution problems, and to organize, through its member associations, international congresses. Particulars of the six founder member associations are given below. The first Congress of the Union was held in London in 1966.

Air Pollution Control Association of America. 4400 Fifth Avenue, Pittsburgh, Pennsylvania 15213.

Established in 1907, with a full-time secretariat since 1950. The Association is a voluntary, co-operative, non-profit organization of 4,000 members who include engineers, scientists, enforcement officials, industrial organization and manufacturers. The Association serves as a forum for discussion of air pollution problems with technical orientation.

It publishes the monthly *Journal of the Air Pollution Control Association*, as well as its *APCA Abstracts*. The Abstracts contain summaries from 4,000 technical journals throughout the world of current air pollution literature.

The Association, governed by a body of 17 members of the Board of Directors, has the purposes of fostering the control of air pollution and improving sanitation of the air. The Association's Technical Council, composed of 40 volunteer committees, works towards international adoption of reasonable engineering performance standards. In addition to members from the United States, the Association presently has members from 40 other countries.

President, 1967-8: Robert L. Stockman.
Executive Secretary: Arnold Arch.

Asociación Argentina Contra la Contaminación del Aire. Sarmiento 680, Buenos Aires, Argentina.

Founded in 1962 as a result of the first Latin American Conference on Air Pollution, and obtained the legal status of a civil association in 1964.

The present membership of 100 includes doctors in medicine, hygiene and chemistry; sanitary engineers, army officers, executives and industrial enterprises. Though non-governmental, many of the members are civil service officers. A grant is made to the association by the municipality of Buenos Aires.

The aims are for the public welfare and to promote the fight against air pollution in the urban and industrial centres of the country, employing scientific, educational and cultural means. An international conference was held at Buenos Aires in November, 1965.

President: Dr. José A. Rispoli.
Secretary-General: Dr. Damian D. Torti.

Association pour la Prevention de la Pollution Atmosphérique. 62 rue de Courcelles, Paris, 8, France.

The objects of the Association are to initiate and co-ordinate studies leading to a better understanding of the problems of air pollution; to organize investigations in the large towns with a view to determining the distribution of air pollution (for which regional groups have been set up); to co-operate with the public authorities in pollution control; to inform and instruct the public; to present exhibitions under the patronage of the Ministry of Health in the large towns; and to publish the three-monthly journal *Pollution Atmosphérique*.

President: M. le Professeur Moureu
Secretary-General: M. Y. Queret.

Heat Control Society, Japan. Kanto-Shin-Etsu Heat Control Society, 9-17, chóme, Mejorodai, Bunkyo, Tokyo, Japan.

The purposes and activities of the Society are to conduct diagnoses of problems, lecture and training courses (including by correspondence) and other publicity activities to promote efficiency of fuels for the following purposes: (i) prevention of loss of fuels; (ii) prevention of heat losses during transmission and transportation; rationalization of combustion, gasification, distillation, heating and heat transmission; and prevention of air pollution from industrial plant.

There are seven other similar societies covering the whole area of Japan. The eight organize central conferences on heat control. Total expenditure is about £63,000 and total membership about 1,900 concerns.

Central Conference on Heat Control
President: Hirotoshi Honda.
Standing Director: Takahide Taga

Kanto-Shin Etsu Heat Control Society
President: Shige Kaweda
Chief Director: Takahide Taga

National Society for Clean Air. Field House, Breams Buildings, London, E.C.4., England.

Full details of the Society will be found in the colour pages of this volume.

VDI-Kommission Reinhaltung der Luft. Dusseldorf, Graf-Recke-Str. 84, Federal Republic of Germany.

The VDI Clean Air Commission is a specialized section of a technical and scientific association, the Verein Deutscher Ingenieure (German Association of Engineers). It comprises collaborators from all the branches of knowledge relating to clean air, including practice, legislation and administration.

Their functions include: determining the causes, nature and extent of air pollution; making emission limits for dust and gases; research on the emission of pollutants and on chimney heights; research on the effects of air pollution; fixing the maximum allowable concentrations for ambient air (Maximale Immissions-Konzentrationen, or MIK); establishment or development of standard procedures for the measurement of dusts and gases both at the discharge points and in ambient air.

There are at present in the Commission more than 300 independent experts and scientists working in honorary capacities on numerous committees, sub-committees and working-groups. The results of their work are laid down in VDI Richtlinien (directives)—Handbuch Reinhaltung der Luft (Clean Air Handbook)—arranged as follows: (i) General; (ii) MIK values, (iii) dispersion of pollutants, (iv) limiting emissions, (v) analysis and measuring techniques. So far, 60 directives have been published; 33 others are either in preparation or planning stage. The Commission also initiates research studies, of which over 100 have been started so far. More than 10m. D.Marks have been provided by public funds for this purpose. (More details of the work of the Commission are included in a booklet "Aufbau, Aufgaben, Forschung", which will be supplied on request by the Commission.)

President: H. Stephany, Min.-Dirig. a.D. Dipl.-Ing.
Secretary: J. Krämer, Dipl.-Ing.

Besides the VDI Clean Air Commission there exists a special documentation centre (VDI-Fachdokumentation Reinhaltung der Luft) which covers the publications in the whole field of air pollution. Up to now, nearly 50,000 citations have been collected and indexed according to a special system. Comprehensive bibliographies are in preparation.

Secretary: W. Seidl.

A new Member of the International Union is:

The Clean Air Society of Australasia

Hon. Secretary: G. J. Cleary, Post Office Box 31, George Street North Post Office, Sydney, New South Wales, Australia.

The Cost of Air Pollution

The most recent general inquiry into the cost of air pollution in Britain was made by a sub-committee of the Committee on Air Pollution (the Beaver Committee), the findings of which were included as an appendix in the final report of the Committee in 1954. Members of the Committee have since stated that they consider the estimates to be too conservative.

The main conclusions of the Report were:

(1) The direct costs of pollution to which figures can be put ("however hazardous") are as follows:

	£m. per annum
Laundry	25
Painting and decorating ..	30
Cleaning and depreciation of buildings other than houses ..	20
Corrosion of metals	25
Damage to textiles and other goods	52·5
	152·5

It is considered that these figures are underestimates, and as certain items have been omitted, it is concluded that the direct costs of air pollution are *of the order of at least £150 million a year.*

(2) The "loss of efficiency". The following figures are given as "a rough guess at possible orders of magnitude": £10m. a year loss to agriculture; £55m. a year loss of working efficiency in manufacturing industry; £60m. a year in other sections, including transport—altogether "the loss of efficiency resulting from pollution might be as great as the direct costs", but to avoid danger of over-estimates a figure of £100m. a year is suggested.

(3) The value of the fuel lost under the conditions which produce smoke is estimated to be £25m. to £50m. a year, but it is considered that this should not be included as one of the costs of pollution.

The total estimated cost is given as £250m. a year, equivalent to £10 per head in the black areas and £5 elsewhere throughout Great Britain, plus the value of the fuel lost.

British Standards relating to Air Pollution

B.S.

- 758 Small domestic hot-water supply boilers using solid fuel.
  - Part 1. Manually-controlled boilers.
  - Part 2. Thermostat-controlled boilers.
- 893 Method of testing dust extraction plant and the emission of solids from chimneys of electric power stations.
- 1251 Open fireplace components.
  - Part 1. Firebacks for use with inset open fires.
  - Part 2. Fireplace surrounds and hearths.
  - Part 3. Adjustable chimney-throat restrictors (insertible).
  - Part 4. Lintels.
- 1252 Domestic solid fuel cookers with integral boilers.
- 1334 Thermal insulating materials.
- 1747 Methods for the measurements of air pollution.
  - Part 1. Deposit gauges.
  - Part 2. Determination of concentration of suspended matter.
  - Part 3. Determination of sulphur dioxide.
  - Part 4. The lead dioxide method.
- 1756 Methods for the sampling and analysis of flue gases.
  - Part 1. Methods of sampling.
  - Part 2. Analysis by the Orsat apparatus.
  - Part 3. Analysis by the Haldane apparatus.
  - Part 4. Miscellaneous analyses.
  - Part 5. Semi-routine analyses.
- 2740 Simple smoke alarms and alarm metering devices.
- 2741 Recommendations for the construction of simple smoke viewers.
- 2742 Notes on the use of the Ringelmann Chart.
  - C: 1957 Ringelmann Chart.
  - M: 1960 Miniature smoke chart.
- 2811 Smoke density indicators and recorders.
- 2845 Coke-burning inset open fires without boiler and without convection.
  - Part 1. Dimensional and constructional requirements.
  - Part 2. Performance and constructional requirements.
- 2978 Measurements of smoke emission from industrial boilers.
  - Part 1. Medium capacity coal-fired water-tube boilers with travelling grates.
  - Part 2. Coal-fired shell boilers with various types of mechanical stokers.
- 3107 Small incinerators for the destruction of hospital dressings.
- 3128 Constructional and performance requirements for inset open fires with boiler and without convection.
- 3142 Manufactured solid smokeless fuels for household use.
  - Part 1. Cokes for domestic open fires.
  - Part 2. Cokes for domestic closed appliances.
- 3250 Thermal testing of domestic solid fuel burning appliances with convection.
  - Part 1. Flue loss method.
  - Part 2. Hood method.
- 3316 Large incinerators for the destruction of hospital waste.
- 3328 Domestic gas pokers and portable underbar ignition burners.
- 3376 Open fires with convection, with or without boiler.

3377 Back boilers for domestic solid fuel appliances.

3378 Domestic heating stoves using coke and other solid fuels.

3405 Simplified methods of measurement of grit and dust emission from chimneys.

3813 Incinerators for waste from trade and residential premises.
Part 1. 1964 Capacities between 50 lb/h and 1,000 lb/h.

3841 Method for the measurement of smoke from manufactured solid fuels for domestic open fires.

3929 Domestic solid fuel ignition pokers and portable undergrate ignition burners for use with commercial butane.

4076 Steel chimneys.

All the above Standards are obtainable direct from the British Standards Institution at British Standards House, 2 Park Street, London, W.1. British Standards are revised, when necessary, by the issue either of amendment slips or of revised editions. It is important that users of British Standards should ascertain that they are in possession of the latest amendments or editions.

The History of Air Pollution in Great Britain

A Chronological Table

1273 Use of coal prohibited in London as being " prejudicial to health."

1306 Royal Proclamation prohibiting artificers from using sea-coal in their furnaces. Record of the execution of one offender.

1307 Commission of Inquiry appointed to " inquire of all such who burnt sea-coal in the city or parts adjoining, and to punish them for the first offence with great fines and ransoms, and upon the second offence to demolish their furnaces."

1578 Queen Elizabeth I " findeth hersealfe greately greved and anoyed with the taste and smoke of the sea-cooles."

1648 Petition of Londoners to Parliament to prohibit the importation of coal from Newcastle on account of the injury they experienced.

1661 John Evelyn submitted his " Fumifugium, or the Smoake of London Dissipated," to Charles II.

1819 Committee appointed by Parliament to inquire how far persons using steam engines and furnaces could erect them in a manner less prejudicial to public health and comfort.

1843 A Select Committee recommended the introduction of a Bill dealing with nuisances from furnaces and steam engines.

1845 Another Select Committee reported that it was not desirable to extend the provisions of an Act beyond furnaces used for steam generation.

1847 The Town Improvement Clauses Act contained a section dealing with factory smoke.

1853-6 Smoke Abatement Acts relating to the Metropolitan area.

1866 The Sanitary Act empowered sanitary authorities to take action in cases of smoke nuisances.

1875 The Public Health Act containing a smoke abatement section on which legislation to the present day has been based.

1881 Smoke Abatement Exhibition at South Kensington organized by the Public Health and Kyrle Societies.

1882 Formation of the National Smoke Abatement Institution.

1891 The Public Health (London) Act.

1899 Formation of the Coal Smoke Abatement Society, led by Sir William Richmond, R.A. and Dr. H. A. Des Vœux (concerned mainly with London).

1909 Sheffield smoke abatement Exhibition, at which was set up the Smoke Abatement League of Great Britain (mainly for the provinces and centred later in Manchester and Glasgow).

1912 International smoke abatement Exhibition in London, organized by the Coal Smoke Abatement Society, leading to the formation of a Committee for the Investigation of Atmospheric Pollution.

1913 Smoke abatement Bill introduced in the House of Commons by A. G. C. Harvey, M.P.

1914 Smoke abatement Bill introduced in the House of Lords by Lord Newton. Withdrawn on the appointment of a Departmental Committee to investigate the problem.

1920 Committee re-formed after the war with Lord Newton as Chairman.

1921 Publication of the Final Report of the Newton Committee.

1926 Public Health (Smoke Abatement) Act by which the 1875 and 1891 Acts were amended and extended.

1927 Establishment of first regional committees of local authorities.

1929 Amalgamation of the Coal Smoke Abatement Society and Smoke Abatement League of Great Britain to form the National Smoke Abatement Society. First publication of a journal (now *Smokeless Air*) devoted to air pollution.

1936 Public Health Act, in which were included the provisions of the smoke abatement Act of 1926.

1946 Simon Report on Domestic Fuel Policy, recommending, *inter alia*, measures for domestic smoke prevention.

1946 First smokeless zone and prior approval legislation (Manchester Corporation Act).

1951 First smokeless zone established (in Coventry).

1952 Ridley Report on " Policy for the Use of Fuel and Power Resources," recommending, *inter alia*, measures for smoke prevention.

1952 London smog disaster, the most serious for many years, with a death roll of 4,000 (*q.v.*).

1953 Beaver Committee on Air Pollution set up by the Government and published an Interim Report.

1954 Final Report of the Beaver Committee.

1954 A Clean Air Bill introduced by Gerald Nabarro, M.P., and withdrawn (4th Feb., 1955) on Government undertaking to introduce their own Bill.

1955 Whole of City of London declared a smokeless zone.

1956 Clean Air Act.

1958 National Smoke Abatement Society became incorporated under new name of National Society for Clean Air.

1959 International Diamond Jubilee Clean Air Conference and Exhibition (NSCA), London.

1962 Smog episode in London and other cities. Estimated death roll of 750 in Greater London.

1962 Holborn M.B. first local authority in country to reach its final target under Clean Air Act.

1964 Amendments to Clean Air Act in Housing Act, 1964, modifying smoke control area policy. Clean Air Act (Northern Ireland).

1966 First Congress of the new International Union of Air Pollution Prevention Associations (in London).

Recent Books, Papers and Reports

A Selected List

Industrial

Local Authority Problems in an Industrial Area. Sugden, F. G. Royal Society of Health Congress, Eastbourne, 24-28th April, 1967.

The Special Industrial Processes. Beighton, J. Royal Society of Health Congress Eastbourne, 24-28th April, 1967.

A Continuous Automated Incinerator, New Installation for Derby. Smokeless Air No. 140. Winter, 1966. 110-117. (3s.)

Gas Cleaning. Strauss, W. pp. 471. Pergamon Press, Oxford. 1966. (£5.)

Domestic

Chimney Design. Heat Transfer and Condensation in Domestic Boiler Chimneys, by L. F. Daws. National Building Studies Research Paper 40. H.M.S.O. (10s. net.)

Road Vehicles

Air Pollution from Road Vehicles. Technical Committee of the National Society for Clean Air, 1967. (3s. net.)

Automotive Air Pollution. Fifth Report of the Secretary of Health, Education and Welfare, to the Congress of the

United States. December, 1966. Document No. 8. U.S. Government Printing Office, Washington.

Carbon Monoxide. A Bibliography with Abstracts. 1966. Public Health Service Publication No. 1503. U.S. Dept. of Health, Education and Welfare, Washington.

Cars for Cities. Reports of the Steering Group and Working Group appointed by the Minister of Transport. 1967. H.M.S.O. (£1 1s. net.)

Research and Investigation

The Investigation of Atmospheric Pollution, 1958-1966. 32nd Report. Warren Spring Laboratory. Ministry of Technology, 1967. H.M.S.O. (10s. 6d. net.)

Report of the Warren Spring Laboratory. 1966. Ministry of Technology. pp. 58. H.M.S.O. (6s. 6d. net.)

Air Quality Criteria for Sulphur Oxides. U.S. Dept. of Health, Education and Welfare. Public Health Service. Washington, D.C.

Effects of Air Pollution

Inhaled Particles and Vapours, II. Edited by C. N. Davies, pp. 605. Pergamon Press, Oxford. 1967. (£7 net.)

Observations from a ten-year study of Pollution at a site in the City of London. Commins, B. T. and Waller, R. E. Atmospheric Environment. Vol. 1. pp. 49-68. Pergamon Press, Oxford 1967.

Fuel

Natural Gas and Clean Air. Eaton, F. J. Smokeless Air, No. 142. Summer 1967. (3s.)

An Introduction to the Study of Fuel. J. C. Macrae. pp. 352. Elsevier Publishing Co. Barking. 1966. (60s. net.)

General

The Economics of Air Pollution. Edited by Harold Wolozin. pp. 318. W. W. Norton & Co. Inc. New York. ($2.95.)

Grit and Dust

Report of the Working Party on Grit and Dust Emission. H.M.S.O. (3s. net.)

Grit and Dust. (MHLG Memorandum). H.M.S.O. (3s. net.)

Grit and Dust. Circular 56/67 (MHLG), 23/67 (WO). (5d. net.)

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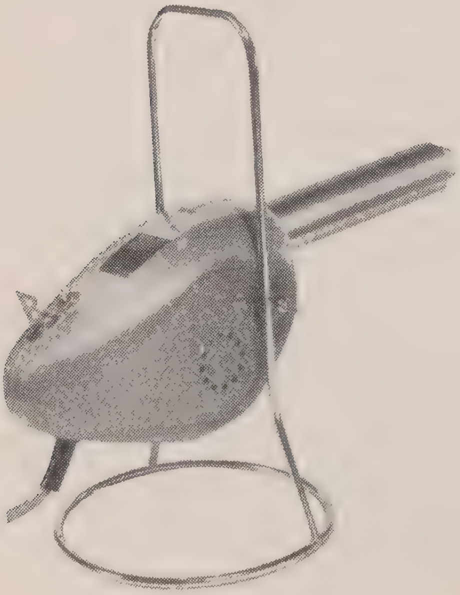


Guide to Publications

This list of available books, reports and pamphlets on smoke prevention, atmospheric pollution and fuel usage is issued by the National Society for Clean Air as a reference guide for readers. It may also be used for ordering the publications which may be obtained either direct from the Society, or other bookseller. In ordering from the Society please quote the code number preceding each title.

Prices in brackets include postage and packing, which must be included when ordering by post, except in the case of orders over £3, which will be sent post-free. If a number of items are ordered together excess postages will be refunded. Prices quoted are those current at the date of publication, and are subject to variation.

Information about older, out-of-print, and overseas publications may be obtained from the Society on request. Most of these are in the Society's library and can be consulted, or in some cases borrowed for short periods, by arrangement.

Except where otherwise stated the publisher is the Society. HMSO.—H.M. Stationery Office. The publications are numbered and orders to the Society may be made by the code number.

Legislation

Acts and Memoranda

82. **Clean Air Act, 1956.** The latest Statute governing smoke, containing sections on dark smoke, smoke from furnaces, grit and dust from furnaces, smoke control areas, smoke nuisances, special cases, clean air council and miscellaneous provisions. (HMSO., 1956) 4&5 Eliz. 2 Ch. 52. 2s. (2s. 5d.)

83. **Clean Air Act, 1956.** Memorandum on Smoke Control Areas. (HMSO, 1956) 1s. 3d. (1s. 6d.)

84. **Clean Air Act, 1956.** Memorandum on Miscellaneous Provisions. (HMSO, 1956) 8d. (11d.)

85. **Amendment to Model Byelaws.** Series IV Buildings (1953) Edition. (HMSO, 1956) 2d. (5d.)

80. **The Clean Air Act, 1956.** A descriptive Summary. (N.S.C.A.) 4s. 6d. per dozen, post free 6d. single copy.

105. **Thermal Insulation (Industrial Buildings) Act, 1957.** (5 & 6 Eliz. 2 Ch. 40). (HMSO, 1957) 6d. (9d.)

118. **Clean Air Act, 1956. Memorandum on Industrial Provisions.** (HMSO, 1958) 1s. (1s. 3d.)

125. **Clean Air Act, 1956. Memorandum on Industrial Provisions (Scotland).** (HMSO, 1959) 1s. (1s. 6d.)

187. **Clean Air Act, 1956. Memorandum on Chimney Heights.** (HMSO, 1963) 1s. 3d. (1s. 6d.)

195. **Housing Act 1964.** (HMSO) 8s. 6d. (9s. 1d.)

196. **West Riding County Council (General Powers) Act, 1964.** (HMSO) 3s. (3s. 6d.)

197. **Clean Air Act (Northern Ireland) 1964. Belfast** (HMSO) 3s. 6d. (3s. 11d.)

Regulations (Statutory Instruments)

86. **Clean Air: The Smoke Control Areas (Authorized Fuels) Regulations, 1956.** Statutory Instruments, 1956 No. 2023. (HMSO, 1956) 2d. (5d.)

104. **Clean Air Council Order, 1957.** Statutory Instruments No. 766, 1957. (HMSO) 3d. (6d.)

113. **Smoke Control Areas (Exempted Fireplaces) Order, 1957.** S.I. No. 541, 1957. (HMSO) 2d. (5d.)

233. **Alkali, etc., Works Order, 1966.** S.I. No. 1143, 1966. (HMSO) 1s. 6d. (1s. 9d.)

117. **Dark Smoke (Permitted Periods) Regulations, 1958.** S.I. No. 498, 1958. 3d. (6d.)

119. **Dark Smoke (Permitted Periods) (Vessels) Regulations, 1958.** S.I. No. 878, 1958. (HMSO) 3d. (6d.)

120. **Clean Air Act, 1956 (Appointed Day No. 2) (Scotland) Order, 1958.** S.I. No. 1931, 1958. (HMSO) 2d. (5d.)

121. **Alkali, etc., Works (Scotland) Order, 1958.** S.I. No. 1932, 1958. (HMSO) 3d. (6d.)

122. **Dark Smoke (Permitted Periods) (Scotland) Regulations, 1958.** S.I. No. 1933, 1958. (HMSO) 3d. (6d.)

123. **Dark Smoke (Permitted Periods) (Vessels) (Scotland) Regulations, 1958.** S.I. No. 1934, 1958. (HMSO) 3d. (6d.)

137. **Smoke Control Areas (Exempted Fireplaces) Order, 1959.** S.I. No. 1207, 1959. (HMSO) 3d. (6d.)

139. **Smoke Control Areas (Exempted Fireplaces) (Scotland) Order, 1959.** S.I. No. 2264 (S. 123), 1959. (HMSO) 3d. (6d.)

191. **Clean Air: The Smoke Control Areas (Authorized Fuels) Regulations 1963.** S.I. No, 1275, 1963. (HMSO, 1963) 3d. (6d.)

198. **The Alkali etc., Works (Scotland) Order, 1965.** S.I. No. 478 (S. 23) 1965. (HMSO) 9d. (1s.)

204. **The Building Standards (Scotland) Regulation, 1963.** S.I. No. 1897 (S. 102) 1963. (HMSO) 11s. 6d. (12s. 2d.)

219. **The Smoke Control Areas (Exempted Fireplaces) (Scotland) Order 1965.** S.I. No. 1284 (S. 57) (HMSO) 3d. net

220. **The Smoke Control Areas (Authorized Fuels) Regulations 1965.** S.I. No. 1508 (HMSO) 3d. net

221. **The Smoke Control Areas (Exempted Fireplaces) Order, 1966.** S.I. No. 217 (HMSO) 3d. net

222. **The Smoke Control Areas (Exempted Fireplaces) (Scotland) Order 1966.** S.I. No. 715 (S. 46) (HMSO) 5d. net

223. **The Smoke Control Areas (Authorised Fuels) (Scotland) Regulations 1966.** S.I. No. 714 (S. 45) (HMSO) 3d. net

234. **The Motor Vehicles (Construction and Use) Regulations 1966.** (HMSO) 6s. 6d. net

Circulars

124. **Smoke Control Areas.** Circular No. 5/59 (26/1/1959). (HMSO) 6d. (9d.)

138. **Exempted Fireplaces Order, 1959.** Circular No. 44/59 (16/7/1959). (HMSO) 3d. (6d.)

164. **Use of Sticks and Paper in Smoke Control Areas.** Circular No. 28/60 (7/7/60). (HMSO) 9d. (1s.)

166. **Notification of Provisional Plans for establishing Smoke Control Areas.** Circular No. 1/61 (16/1/1961). (HMSO) 3d. (6d.)

167. **Air Pollution—Measurement and Research.** Circular No. 12/61 (10/4/1961). (HMSO) 3d. (6d.)

168. **Selection of Open Fires for Coke Burning.** Circular No. 28/61 (5/6/1961). (HMSO) 3d. (6d.)

169. **Works of Adaptation Eligible for Grant.** Circular No. 31/61 (26/6/1961). (HMSO) 3d. (6d.)

170. **Industrial Furnaces.** Circular No. 42/61 (29/8/1961). (HMSO) 2d. (5d.)

171. **Smoke Control in the Black Areas.** Circular No. 4/62 (30/1/1962). (HMSO) 5d. (8d.)

172. **Smoke Control Areas.** Circular No. 3/62 (30/1/1962). (HMSO) 1s. (1s. 3d.)

177. **Alkali, etc., Works Regulation Act, 1906.** Circular No. 23/63 (22/3/63). (HMSO)

178. **"Homes for Today and Tomorrow".** Circular No. 13/62 (12/2/62). (HMSO) 3d. (6d.)

179. **Fuel Storage in New Local Authority Housing.** Circular No. 50/62 (1/10/62) (HMSO) 3d. (6d.)

180. **Smoke Control Programmes, 1962-1966.** Circular No. 60/62 (18/12/62). (HMSO) 3d. (6d.)

181. **Gas Cokes as Open Fire Fuels.** Circular No. 7/63 (2/4/63 (HMSO) (8d.)

188. **Chimney Heights.** Circular No. 25/63 (15/5/63). (HMSO) 3d. (6d.)

190. **Smoke Control Areas.** Circular No. 69/63 (17/12/63). (HMSO) 1s. (1s. 3d.)

205. **Housing Act 1964. Section 95: Amendment of the Clean Air Act, 1956.** Circular No. 46/64 (14/8/64). (HMSO) 5d. (8d.)

206. **Housing Act 1964. Designation of Direct Acting Electric Space-Heaters.** Circular No. 60/64 (18/12/64). (HMSO) 3d. (6d.)

207. **Disposal of old Motor Vehicles.** Circular No. 8/65 (11/2/65). (HMSO) 9d. (1s.)

208. **Smoke Control Areas: Supplies of Solid Smokeless Fuel.** Circular No. 13/65 (17/3/65). (HMSO) 9d. (1s.)

209. **Heating of Public Buildings.** Circular No. 46/65 (2/6/65). (HMSO)

Smoke Control Areas: Grant Arrangements. Circular No. 51/65 (29/6/65). (HMSO)

224. **Tall Buildings and Industrial Emissions.** Circular No. 69/65 (18/10/65) (HMSO) 3d. net

225. **Smoke Control Areas: Estimates and Final Costs.** Circular No. 77/65 (31/12/65) (HMSO) 9d. net

226. **Smoke Control Areas (Authorised Fuels) (No. 2) Regulations 1965.** Circular No. 18/66 (16/3/66). (HMSO) 3d. net

235. **I Grant Arrangements. II Model Question and Answer Booklet. III Exempted Appliances.** Circular No. 25/66 (3/6/66). (HMSO) 1s. net

236. **Supplies of Solid Smokeless Fuels.** Circular 25/67 (Ministry of Housing and Local Government) Circular 35/67 (Welsh Office) (30/5/67) 8d. net

Other Government Publications

58. **Committee on Air Pollution.** The Interim Report of the Beaver Committee appointed in July, 1953, to examine the nature, causes and effects of air pollution and the efficiency of present preventive measures; to consider what further preventive measures are practicable; and to make recommendations. (Cmd. 9011.) (HMSO, 1953.) 2s. 6d. (2s. 11d.)

71. **Committee on Air Pollution.** The Final Report of the Beaver Committee. (Cmd. 9322). (HMSO, 1954.) 5s. 6d. (5s. 11d.)

92. **Mortality and Morbidity During the London Fog of December, 1952.** Ministry of Health, Reports on Public Health and Medical Subjects, No. 95. (HMSO, 1954.) 2s. 6d. (2s. 11d.)

132. **The Efficient Use of Fuel.** (HMSO, for Ministry of Power). 35s. (37s.)

44. **Housing Manual, 1949.** The official recommendations on housing practice. The section on the heat installation may be regarded as the basis of present-day smoke prevention policy. (HMSO, 1949)

155. **Report of the Committee on Solid Smokeless Fuels.** (Cmd. 999, HMSO, 1960). 1s. 3d. (1s. 6d.)

The Investigation of Atmospheric Pollution. Reports by the Fuel Research or Warren Spring Laboratory, Ministry of Technology co-ordinating local observations of atmospheric pollution.

75. **27th Report (1944-54).** (HMSO, 1955.) 7s. 6d. (8s. 2d.)

106. **28th (1954-55). Report** (HMSO, 1957.) 5s. 6d. (6s. 1d.)

134. **29th Report (1955-56).** (HMSO, 1958.) 7s. (7s. 8d.)

237. **31st Report (1957-58).** (HMSO, 1966). 8s. (8s. 8d.)

238 **32nd Report (1958-66).** (HMSO, 1967.) 10s. 6d. (11s. 2d.)

182. **Smoke Control (England and Wales) 1962-66.** Summary of programmes of local authorities for establishment of Smoke Control Areas. (Cmnd. 1890, HMSO) 3s. 6d. (3s. 9d.)

189. **Domestic Fuel Supplies and the Clean Air Policy.** (Presented to Parliament by the Minister of Power, December, 1963). (Cmnd. 2231, HMSO) 1s. 6d. (1s. 9d.)

227. **101st Annual Report on Alkali etc., Works for 1964.** Chief Inspectors, HMSO, 1965 (5s. 6d.)

228. **102nd Annual Report on Alkali etc., Works for 1965.** Chief Inspectors, HMSO, 1966. (7s. 6d.)

103rd Annual Report on Alkali etc., Works for 1966. Chief Inspectors, HMSO, 1967 (7s. 6d.)

Grit and Dust. See page 56 for information on new reports.

General

11. **Smoke: The Problem of Coal and the Atmosphere.** Arnold Marsh. A comprehensive

textbook on the causes, consequences and means for prevention of smoke. Illustrations and bibliography. (Faber and Faber Ltd., 1947.) 21s. (21s. 9d.)

13. **Smokeless Air.** The Society's quarterly magazine-type journal. News, articles, photographs, comment. 12s. per annum, post free 3s. (3s. 5d.)

131. **Air Pollution.** Ed. M. W. Thring. Butterworths.) 42s. (43s.)

15. **Fumifugium or the Smoake of London Dissipated.** John Evelyn. The famous diarist's well-known tract (1661) reprinted by the Society. Special tercentenary issue. Cloth bound 5s. (5s. 6d.). Paper back 2s. 6d. (2s. 9d.).

142. **New Stoker's Manual.** (National Industrial Fuel Efficiency Service.) 2s. 6d. (2s. 11d.)

183. **Air Pollution.** Edited by Arthur G. Stern. In 2 vols., pp. 656 and 586. Academic Press, New York and London. Vol. 1 (143s.). Vol. 2. (132s.).

193. **Smoke Inspector's Handbook** by A. Coe and I. M. Coe, from Clean Air Information Service, The College of Fuel Technology, 90 Talbot Road, London, N.6. Volume 1: 40s.; Volume 2: 50s. (post free).

194. **The Control of Air Pollution.** Alan Gilpin. pp. 514. Royal 8vo. London, Butterworths. 120s.

210. **Atmospheric Pollution: Its Origins and Prevention.** Meetham, A. R., in collab. with Bottom. D. W. and Cayton, S. 3rd revised edition. pp. 301, Pergamon Press, Oxford. 70s. net.

211. **Clean Air—Law and Practice.** Garner, J. F. and Crow, R. K. pp. 385, Shaw & Sons, London. 63s.

212. **Gas Purification Processes.** Ed. by G. Nonhebel, pp. 894, George Newnes, London. £7 net

229. **Air Pollution.** Smith, A. R. Monograph No. 22, Society of Chemical Industry, 14 Belgrave Square, London, S.W.1. 1966. £3

Conference Proceedings

(Details of earlier Conference Proceedings available on request)

61. **Glasgow Conference, 1953.** The Des Vœux Memorial Lecture—"Atmospheric Pollution in Relation to Preventive Medicine," and papers on the London Fog Disaster, Smokeless Zones, Production, Use and Availability of Solid Smokeless Fuels and the Efficient and Smokeless Combustion of Fuel Oils. 7s. 6d. (7s. 11d.)

70. **Scarborough Conference, 1954.** The Des Vœux Memorial Lecture—"Air Pollution and Plant Life," Address by Sir Hugh Beaver, Presidential Address: "The Coal Crisis and the Society," papers on Rail Transport and Smoke Abatement, the Industrial Uses of Gas and the Industrial Uses of Electricity. 7s. 6d. (7s. 11d.)

87. **Southport Conference, 1956.** The Des Vœux Memorial Lecture—"Clean Air: The Next Chapter," Presidential Address, Progress Reports, Local Authorities and the Clean Air Act, Clean Air and the Housewife. 12s. 6d. (12s. 11d.)

98. **Hastings Conference, 1957.** The Des Vœux Memorial Lecture—"Meteorology and Air Pollution," Address by the Minister of Power, Lord Mills, Presidential Address, and papers on the Administration of the Clean Air Act, Industry and the Clean Air Act, and Pollution from Road Vehicles. 12s. 6d. (12s. 11d.)

126. **Llandudno Conference, 1958.** The Des Vœux Memorial Lecture—"Clean Air, Urban Amenity, and the Growth of Towns," Address by the Minister of Housing and Local Government, Presidential Address, Industrial Aspects of the Clean Air Act, Forum on Smoke Control Areas, and papers on Air Pollution in London and its Smokeless Zones, Air Pollution and Respiratory Disease, Hazards from Airborne Radioactive Matter, and An Automatic Stoker for Central Heating. 12s. 6d. (12s. 11d.)

140. **London, 1959: Diamond Jubilee International Clean Air Conference.** Containing Opening Address by Sir Graham Sutton, F.R.S.; 78 Papers on National Air Pollution Problems, Legislation, Education; Technical Problems; Observations, Investigation and Measurement; Research and International Co-operation; Discussions and Authors' Replies. 30s. (32s. 6d.). (Reprints available of some of the Papers).

144. **Harrogate Conference, 1960.** The Des Vœux Memorial Lecture—"Clean Air, Public Opinion and the Press," Address by Parliamentary Secretary, Ministry of Housing and Local Government, Series of progress reports on (1) Research and Investigation; (2) Domestic Heating; (3) Industrial Problems, Papers on Air Pollution from Road Vehicles, and an Inquiry into the Working of the Clean Air Act. 25s. (25s. 8d.)

175. **Brighton Conference, 1961.** Opening Address by John C. George, Parliamentary Secretary, Ministry of Power. Presidential Address by Lord Cohen of Birkenhead. Reports on National Survey of Air Pollution, Furnace Operators Bill, Diesel Smoke; Papers on Industrial Aspects of the Clean Air Act, Whole House Heating, Smoke Control Areas and Transatlantic Discussion. 15s. (15s. 7d.)

213. **Harrogate Conference 1962 (Pre-Prints only).** Presidential Address by Lord Cohen of Birkenhead. Three technical papers on pollution control in the steel industry, at coking plants and from iron foundry cupolas; International Session; the 1958 Alkali Order Processes; Domestic Smoke "Questions and Answers"; Incineration and Waste Disposal. 5s. (5s. 3d.)

214. **Harrogate Conference 1964** Opening Address by the Rt. Hon. Lord Sherfield. Presidential Address by Dr. Albert Parker. Smoke Control Area Reports from 8 regions; two papers on Air Pollution and Town Planning, four papers on the future supply of smokeless fuels; Des Vœux Memorial Lecture—"A Century of Achievement"; a paper on road vehicle pollution and discussion on the Sulphur Dioxide Report. 25s. (25s. 6d.)

230. **Eastbourne Conference 1965.** Opening Address by John Morris, M.P., Parliamentary Secretary, Ministry of Power. Presidential Address by Sir Alan Wilson, F.R.S. Three Reports on Successes with Smoke Control; two papers on solid fuel distribution and supply problem; air pollution and mortality; odour control; control of pollution from road vehicles; four papers on new horizons in domestic heating; two papers on industrial problems; two papers on unresolved problems in air pollution. 25s. (25s. 6d.)

International Clean Air Congress, London, 1966

239. **Proceedings: Part I** (In English, French and German) 91 papers from 20 countries. World review, domestic, other space heating and town planning, industrial problems; fumes and gases, research and investigations; standards and regulations, legislation and international co-operation. 40s. (postage and packing extra)

240. **Proceedings: Part II** Reports of the sessional Rapporteurs, discussions on the Papers, replies by the Authors; remarks of the Chairmen and Vice-Chairmen. 30s. (postage and packing extra).

Reprints:

Des Vœux Memorial Lectures

45. **Towards the Better Use of Coal.** Dr. D. T. A. Townend, 1950. 2s. 6d. (2s. 9d.)

77. **Air Pollution and Plant Life.** Sir Edward Salisbury, 1954. Pre-prints only. 6d.

78. **The Destructive Effects of Air Pollution on Materials.** Dr. A. Parker. 1955. 1s. (1s. 3d.)

102. **Meteorology and Air Pollution.** Sir Graham Sutton, 1957. 1s. (1s. 3d.)

130. **Clean Air, Urban Amenity and the Growth of Towns.** Sir William Holford, 1958. 1s. (1s. 3d.)

152. **Clean Air, Public Opinion and the Press.** Sir Linton Andrews, 1960. 1s. (1s. 3d.)

214. **A Century of Achievement.** J. S. Carter, 1964. (In Proceedings of 1964 Harrogate Conference and *Smokeless Air* No. 132, Winter, 1964).

Other Reprints

145. **Some factors concerning Diesel Engine Exhaust Fumes.** J. K. Lock, 1960. 1s. (1s. 3d.)

146. **Methods of Removing Smoke from Road Vehicles.** L. E. Reed and S. C. Wallin, 1960. 1s. (1s. 3d.)

147. **Sampling for 3:4 Benzpyrene in Flue Gas from Plant fired by Petroleum Fuels.** E. L. Howe, 1960. 1s. (1s. 3d.)

148. **Trends in the Pollution of the Air of Gt. Britain, 1952-59.** J. Carroll, S. R. Craxford, H. E. Newall, P. M. Weatherley, 1960. 1s. 3d. (1s. 6d.)

149. **Pollution Levels in Cities.** F. P. Williams, 1960. 1s. (1s. 3d.)

150. **Accuracy and Reliability of Instruments in Common Use for Measurement of Air Pollution.** S. R. Craxford, E. T. Wilkins, D. W. Slimming, 1960. 1s. (1s. 3d.)

165. **Air Pollution from Road Vehicles.** Reprint of Papers and Discussions, 1960. 3s. (3s. 3d.)

185. **Mitigation of Air Pollution at Coking Plants.** R. L. Cooper and J. P. Graham, 1962. 1s. (1s. 3d.)

186. **Incineration and Waste Disposal.** S. Cayton. 1962. 1s. (1s. 3d.)

215. **Power Stations and Clean Air.** G. N. Stone and A. J. Clarke. 1963. 1s. (1s. 3d.)

216. **Air Pollution and Town Planning.** S. R. Craxford and M-L. P. M. Weatherly. 1964. 1s. (1s. 3d.)

231. **Solid Fuel Distribution and Supply Problems.** W. H. Bourne, 1965.

232. **Odour Control by Catalytic Combustion.** E. Betz, 1965.

Reprints of International Congress, London, 1966, Papers

The following papers only are available, in limited quantity. Price 2s. 6d. each, including postage.

241. **Herkunft und Ausbreitung von Luftverunreinigungen, Ermittelt durch Stationäre Registrierung Mehrerer Immissionskomponenten.** Breuer W. und Winkler K.

242. **Study of the Effect of Air Pollution Upon Respiratory Diseases in London in the Winters of 1962-63 and 1963-64.** S. J. Carne.

243. **Pollution de L'Atmosphère De Paris par Les Gaz D'Echappement des Véhicles Automobiles. Mesure Des Niveaux Et Premiers Remèdes Envisagés.** P. Chovin and R. Thiebault.

244. **Alleviation of Air Pollution in the Coking Industry.** R. L. Cooper, and G. W. Lee.

245. **Smoke and Sulphur Dioxide in Great Britain: Distribution and Changes.** S. R. Craxford, Marjorie Clifton and Marie-Louise P. M. Weatherly.

246. **Konzentrationsbestimmungen Teilchen förmiger: Luftverunreinigungen im Ruhrgebiet.** K. H. Friedrichs und A. Brockhaus.

247. **The Working Party on Air Pollution—European Federation of Chemical Engineering.** D. Gall.

248. **Die Vertikalverteilung des Kohlenmonoxid in Grosstadstrassen in Abhängigkeit von den Meteorologischen Bedingungen.** Hans-Walter Georgii.

249. **Sulphur Dioxide Concentrations Measured around a Modern Power Station.** E. W. F. Gillham, A. Martin and F. R Barber.

250. **Oil Burners for Domestic Application; Present Design and Future Developements.** B. Gills and E. L. Howe.

251. **Calculated Versus Continuously Measured SO_2 Concentrations with Regard to Minimum Stack Heights and Urban Renewal** (urbanisme). K. Gräe.

252. **Tomorrow's Town Transport—The Advantages of Electric Traction.** A. N. Irens.

253. **Verfahren zur Verminderung der durch Die Zementindustrien Verursachten Luftverunreinigungen.** W. Köhler.

254. **Sub-Minute Continuous Nitrogen Dioxide Analysis.** E. L. Kothny and P. K. Mueller.

255. **Determining Source Reduction Needed to Meet Air Quality Standards.** Ralph I. Larsen.

256. **Progress in Air Pollution Control in South Africa.** C. E. Latsky and E. C. Halliday.

257. **Standards of Emission under the Alkali Act.** E. A. J. Mahler.

258. **Tree Belts as a Protection against the Harmattan in Nigeria.** B. A. Molski.

259. **Towards Cleaner Diesel Engine Exhausts.** R. E. Pegg and A. W. Ramsden.

260. **International Dust and Fume Collection Problems.** G. G. Schneider.

Miscellaneous

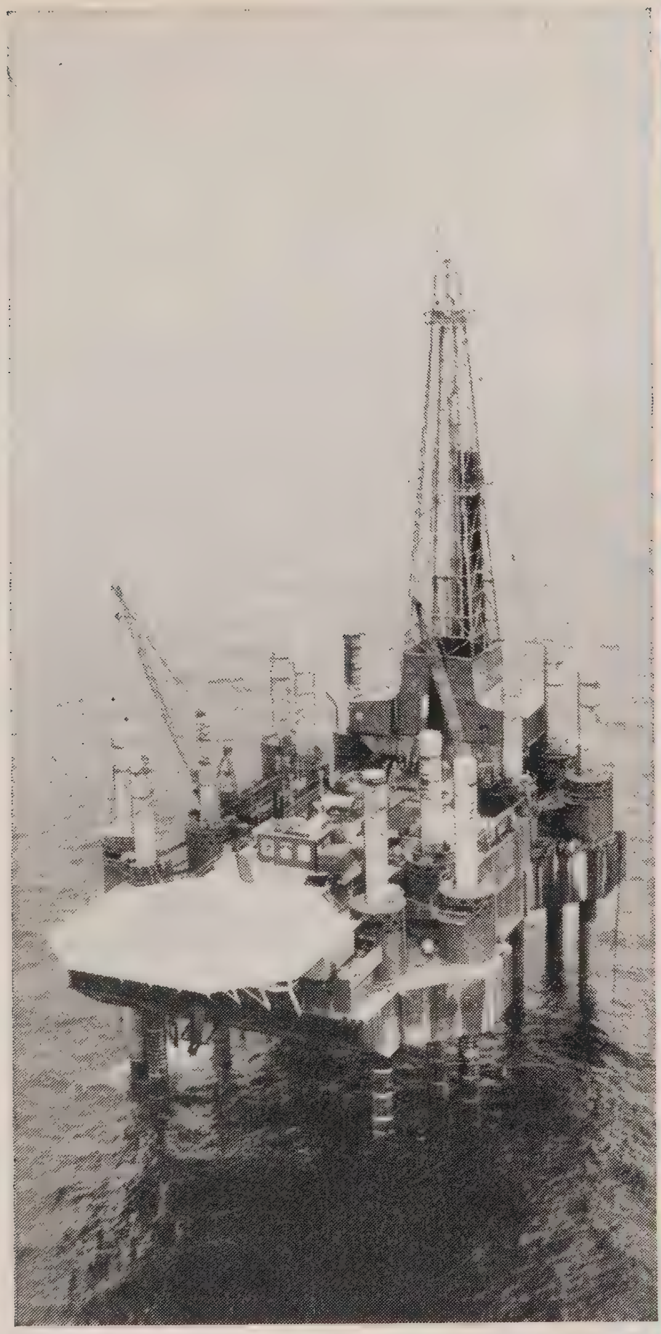
93. **Ringelmann Smoke Chart** (with instructional leaflet). Chart for measuring smoke density. (Charles Griffin & Co. Ltd.) 1s. 2d. each, 3 for 2s. 6d., 6 for 4s. 2d., 12 for 7s. 2d., including postage.

112. **'Power's' Microringelmann.** Direct facsimile reduction of the standard Ringelmann Chart (McGraw-Hill). Single copies, 2s. 6d. (2s. 9d.) 27s. 6d. per dozen, post free.

217. **Sulphur Dioxide.** An Examination of Sulphur Dioxide as an Air Pollutant by the Technical Committee of the Nat. Soc. for Clean Air. 2s. (2s. 3d.)

218. **Clean Air.** Notes for Teachers and Lecturers. Nat. Soc. for Clean Air. 1s. 6d. (post free)
Clean Air Wall Chart (with Notes for Teachers, as above). From Educational Productions Ltd., 17 Denbigh Street, London, S.W.1. 2s.

Air Pollution from Motor Vehicles. A Report by the Technical Committee of the Nat. Soc. for Clean Air. 3s. (3s. 3d.)



Above: Mr. Louie, the North Sea drilling rig which discovered gas for the Gas Council—Amoco Group.

Rich reserves of natural gas under the North Sea will transform the future for Britain's fast developing Gas Industry. Already the exploitation of new manufacturing techniques based on oil and the scheme for importing methane from North Africa have given the industry an entirely new look. Together, these advances promise ample supplies of gas at increasingly competitive prices.

High Speed Gas for clean air zones

Domestic heating is the most important consideration when a district becomes a Smoke Control Area.

Consider the advantages of gas. Most homes use gas for cooking. A clean, smokeless fuel is on tap. The installation of radiant-convector gas fires providing automatic, efficient, labour-free heating is a simple matter. They are as cheap to run as traditional fires and because tariffs improve as more gas is used, the householder gains additional economies. Gas appliance sales are booming, particularly those for heating the home. The public wants this clean, convenient, economical fuel. It is the ideal answer to smoke control problems. Gas Boards offer a comprehensive service and have helped many local authorities with advice on clean air conversions. The Commercial Manager of your Gas Board would be pleased to help you.

HIGH SPEED GAS

Films and Filmstrips

Following is a list of films and filmstrips on air pollution and its prevention, fuel efficiency, etc. Application for the loan of the films (or purchase of the filmstrips) should be made to the issuing organization, referred to in the list by its initials, the key to which is given at the end of the list. Most of the films are available free, but the question of charges should be settled with the issuing organization, to whom 2-3 weeks advance notice of hire should be given. The running time in minutes is shown. Unless otherwise indicated, the films are available in both 16 and 35 mm. sizes, with sound.

The Society welcomes information on other films suitable for inclusion in future editions of the Year Book.

Films

GENERAL AND EDUCATIONAL

Family Album. The problems of domestic life confronting successive generations of a middle-class family from 1851-1965. 30 mins. G.C.

The First Mile Up. The experience of cities in North America making vigorous efforts to combat air pollution. Smoke prevention in Toronto. Particularly well illustrated. 16 mm. 28 mins. N.F.B.C.

DOMESTIC AND SMOKE CONTROL AREAS

Window to the Sky. Excellent colour film, showing technique of setting up smoke control area. Suitable for general publicity, and for showing to members of local authorities. 22 mins. G.C.

Clean Air. Colour film dealing with air pollution and showing how modern methods of domestic heating meet the requirements of the Clean Air Act. 22 mins. S-M & B.P. Ltd.

Arthur Clears the Air. A film in colour intended for showing at meetings where the Clean Air Act and Smokeless Zones are discussed. 27 mins. N.C.B.

French Architecture and Modern Heating. Modern solid fuel heating systems in a wide range of applications to buildings all over France are featured in this colour film which has been adapted in English by the N.C.B. Film Unit. 27 mins. N.C.B.

People Like Us. An amusing colour film about solid fuel home-heating. N.C.B.

Report from America: Smog. Concerted action by the inhabitants of Pittsburgh, Pennsylvania, at one time gravely affected by industrial and domestic air pollution, has eventually rid the city of lethal "smog" and ensured a pure atmosphere. This film gives an account of their campaign. 30 mins. C.F.L.

Housewarming. "The Bartons" decide to install solid smokeless fuel central heating. 17 mins. N.C.B. (In colour.)

It Takes Your Breath Away. The need to speed up the implementation of the Clean Air Act is emphasized. Contains a vividly compelling sequence on the health aspects. 16 mm. 16 mins. B.M.A.

Gas in Modern Housing. Stresses the need to incorporate clean air principles in new house design. 16mm. 18 mins. G.C.

Project—Halton Fields. Features a modern housing estate where developers have used domestic oil fired central heating on a district level. Colour. 20 mins. S-M & B.P.

Group Heating in Paisley. District Heating claims great advantages over the more conventional domestic heating particularly in new development areas as shown in this study of urban renewal in Paisley. Colour. 7 mins. N.C.B.

Leicester District Heating. Similar theme to the above but a more ambitious and extensive project. Colour. 10 mins. N.C.B. (Available October 1967.)

Welcome Home. The case histories of three householders in newly created smokeless zones in Sheffield. The range of solid smokeless fuels and heating appliances available is fully covered. Colour. 26 mins. N.C.B. (Available October 1967.)

FUEL, POWER AND INDUSTRIAL

Fluidized Coal Carbonization and Hot Briquetting. To provide sufficient smokeless fuels to meet the increasing demand, the N.C.B. Coal Research

Establishment has developed a new smokeless fuel. 12 mins. N.C.B.

Homefire. Smokeless fuel for the open fire. Based on small-sized smoky coal the new smokeless fuel is now in quantity production at Birch Coppice. The manufacture of the briquettes is explained non-technically. 12 mins. N.C.B. (In colour.)

Using the Coal. Shows various uses of coal, and its place among modern sources of energy. 37 mins. 16 mm. only. N.C.B.

Mechanical Firing of Coal. A group of six colour films presenting the main types of mechanical stoker. Total length 60 mins. N.C.B.

Coal: Our Wasting Asset. This film deals with fuel efficiency, fuel conservation and the problem of smoke. 10 mins. N.C.B.

Saharan Venture. Methane gas from the Sahara is helping to provide Britain with abundant supplies of clean fuel. This film tells the story of the venture in colour. 28 mins. G.C.

The Methane Story. A longer version of the above film made for the benefit of specialists. Emphasizes the methods and techniques employed. Colour, 16 mm. 28 mins. G.C.

Clearing the Air. In many districts much more remains to be done if the Act is to be effective. This film shows the contribution of the Gas Industry to progress. Colour. 12 mins. G.C.

Oil Fuel Combustion. Shows effects of bad firing and inefficient fuel combustion. Set in a destroyer at sea. 29 mins. 16 mm. only, silent. C.F.L.

Power in Trust. Electricity plays an important role in all our lives. Through the eyes of a schoolboy the generation of electricity in a modern power station is explained. Colour, 15 minutes. M.R., C.E.G.B.

Burning Your Fuel. Shows how simply heat is lost, and methods of prevention. 10 mins. 16 mm. only. N.I.F.E.S.

Firing Your Fuel. Mechanical firing for solid smokeless fuels. 8 mins. 16 mm. only. N.I.F.E.S.

Atomization. Discusses the technical aspects of combustion of oil fuels. 17 mins. S-M & B.P. Ltd.

Combustion and the Chain Grate Stoker. Shows chemical and physical principles of coal, combustion, and their application in chain grate stoker. 25 mins. B. & W.

Pulverized Fuel. Deals with principles of pulverized fuel use. 40 mins. B. & W.

Industrial Electric Heating. Colour film on the use of electricity for industrial heating processes. 30 mins. E.C.

You and Your Fuel. This film attempts to show the many variations in the quality of coal, due to natural causes and why all the dirt and water cannot be removed before the coal is delivered to the customer. 16 mm. only. N.I.F.E.S.

You and Your Diesel. The importance of maintenance for diesel-engined lorries and tractors. In colour. 35 mins. S-M. & B.P. Ltd.

Combustion. An instructional film for service engineers and boilerhouse staff. 30 mins. H.B.

Steam and Steam Generation. Film deals with the properties of steam, early boiler design and the modern steam generator design. Colour. 16 mm. Sound. 31 mins. I.C.

Running the Low Ram Stoker. Shows the operational technique for the Low Ram Cooking Stoker. 16 mm. 25 mins. H.B.

Synchromatic. Deals with a new revolutionary under feed stoker showing the working in detail. Colour. 16mm. 8 mins. H.B.

Gas Flow. Research into the effects of various types of flue baffles and bridge heights. 16 mm. 7 mins. H.B.

Air Flow. Experiments on the hydraulic flow model applied to the Chain Grate stoker. 16 mm. 9 mins. H.B.

Steambloc a Packaged Deal. Describes a widely used packaged boiler which is both clean and efficient in operation. Colour. 16 mm. Sound. 14½ mins. S.B.C.

The Properties of Coal. Explains difference between various coal gradings. Explanation of swelling number. 16 mm. 18 mins. H.B.

Key to Issuing Organizations:

A.I.L.—Allied Ironfounders Ltd., Brook Street, London, W.1.

B.M.A.—British Medical Association, Film Library, Tavistock Square, London, W.C.1.

B. & W.—Babcock & Wilcox Ltd., Babcock House, 209 Euston Road, London, N.W.1.

C.F.L.—Central Film Library, Government Buildings, Bromyard Avenue, Acton, London, W.3.

E.C.—The Electricity Council, EDA Division, Trafalgar Buildings, 1 Charing Cross, London, S.W.1.

G.C.—The Gas Council, Hyde Park

House, 4-5 Grosvenor Place, London, S.W.1.

H.B.—Hodgkinson Bennis Ltd., Little Hulton, Walkden, Manchester.

I.C.—International Combustion Ltd., 19 Woburn Place, London, W.C.1.

M.R., C.E.G.B.—Public Relations, Midlands Region, C.E.G.B., Haslucks Green Road, Shirley, Solihull, Warwickshire.

N.C.B.—National Coal Board, Film Department, 26-28 Dorset Square, London, N.W.1.

N.F.B.C.—National Film Board of Canada, 1 Grosvenor Square, London, W.1.

N.I.F.E.S.—National Industrial Fuel Efficiency Service, 71/72 Grosvenor Street, London, W.1.

S-M & B.P. Ltd.—Shell-Mex and B.P. Film Library, 25 The Burroughs, Hendon, London, N.W.4.

SBC—Spencer Bonecourt Clarkson Ltd., 165 Great Dover Street, London, S.E.1.

Film Strips

Air Pollution. Black and white. Prepared in consultation with Association of Public Health Inspectors. General survey of problem, methods of measurement, etc. (prepared by Camera Talks). Available from Society, complete with lecture notes, price 2 guineas. (Quote Ref. No. CT.58). Also **The Public Health Inspector.** Colour. £2 12s. 6d. (Quote Ref. No. CT.24).

The Role of Industry. Colour. Deals with the general problem, illustrates plant and appliances for preventing smoke and grit. (Prepared by Camera Talks in conjunction with Association of Public Health Inspectors). Available from Society, complete with lecture notes, £2 12s. 6d.

Smoke Control Areas. Colour. Deals with setting up of smoke control areas. Suitable for general public, officers and members of local authorities. (Prepared by Camera Talks in conjunction with Association of Public Health Inspectors). Available from Society, complete with lecture notes, £2 12s. 6d.

Air Pollution. (A) Its nature, production and effects, and (B) its dispersion and accumulation. Two film strips in colour, each containing 32 frames. Script by R. S. Scorer, PH.D. Foreword by Sir Hugh Beaver. (Prepared by Diana Wyllie Ltd.). Available from Society, price £4 the pair. (Quote Ref. No. DW.F.22/23).

Chronic Bronchitis. Colour. Shows effects of Air Pollution in causation of Bronchitis. Lecture notes by Dr. J. L. Burn. with Appendix on Air Pollution. (Diana Wyllie Ltd., in co-operation with Pfizer Ltd.). Available from the Society, price £2.

The Clean Air Act and Oil Fuel. Semi-animated film strip in colour. 16 mm. sound. For use on film projector. Outlines position of oil fuel in relation to Clean Air Act. Available on loan from Public Relations Department, Shell-Mex and B.P. Ltd., Shell-Mex House, Strand, London, W.C.2.

Good-Bye Smog. An illustrated talk using a series of 2 in. x 2 in. slides; covers all aspects of the Clean Air Act and gives valuable advice on fuels, grants and appliances. Inquiries to:- The Women's Advisory Council on Solid Fuel, 18 South Molton Street, London, W.1.

DIRECTORY OF ORGANIZATIONS

with Air Pollution Interests

Great Britain

Alkali Inspectorate:

Chief Inspector, Ministry of Housing and Local Government. Whitehall, London, S.W.1. (Victoria 8540. Ext. 9).

Deputy Chief Inspectors, Ministry of Housing and Local Government, Whitehall, London, S.W.1. (Victoria 8540. Ext. 574 and 575.)

Chief Inspector for Scotland, Scottish Development Department, 21 Hill Street, Edinburgh, 2. (031-226 5208).

Architects and Surveyors, Incorporated Association of, 29 Belgrave Square, London, S.W.1. (Belgravia 3755/7).

Architects, Royal Institute of British, 66 Portland Place, London, W.1. (01-580 5533).

Arts, Royal Society of, 6-8 John Adam Street, London, W.C.2. (01-839 2366).

British Industrial Measuring and Control Apparatus Manufacturers' Association, 23/24 Margaret Street, London, W.1. (01-580 9336).

British Ironfounders' Association, 30 St. James's Square, London, S.W.1. (01-930 6866 and 6436) and Fleming House, Renfrew Street, Glasgow, C.3. (Douglas 0826-7).

British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1. (Euston 4499).

British Oil & Gas Firing Equipment Manufacturers' Association, 69 Cannon Street, London, E.C.4. (01-248 4444).

British Standards Institution, British Standards House, 2 Park Street, London, W.1. (Mayfair 9000).

British Steel Castings Research Association, The, East Bank Road, Sheffield, 2. (Sheffield 28647).

Building Centre, The, 26 Store Street, London, W.C.1. (01-636 5400).

Building Research Station, Bucknalls Lane, Garston, Watford, Herts. (Garston, Herts. 4040).

Cast Iron Research Association, British, Alvechurch, Birmingham. (Redditch 2715).

Central Electricity Generating Board, Sudbury House, 15 Newgate Street, London, E.C.1. (01-248 1202).

Chemical Engineers, Institution of, 16 Belgrave Square, London, S.W.1. (Belgravia 3647).

Chemistry, Royal Institute of, 30 Russell Square, London. W.C.1. (01-680 3482).

City and Guilds of London Institute, 76 Portland Place, London, W.1. (01-580 3050).

Civic Trust, Walter House, Bedford Street, Strand, London, W.C.2. (Temple Bar 5202).

Civil Engineers, Institution of, Great George Street, London, S.W.1. (01-839 3611).

Clean Air Council, Ministry of Housing and Local Government, Whitehall, London, S.W.1. (Victoria 8540, Ext. 681).

Clean Air Council for Scotland, Scottish Development Department, 21 Hill Street, Edinburgh, 2. (031-226 5208).

Clean Air, National Society for:
Central Offices: Field House, Breams Buildings, London, E.C.4. (01-242 5038).
East Midlands Division: Health Department, Town Hall, Chesterfield. (77232, Ex. 260).
North-East Division: Health and Social Services Department, Civic Centre, Barras Bridge, Newcastle-upon-Tyne, 1. (Newcastle 28520).
North-West Division: Health Centre, Salford, Lancs. (PEN 5891, Ext. 263).
Northern Ireland Division: Public Health Department, 414 Ormeau Road, Belfast, 7. (642905).
Scottish Division: 73 John Street, Glasgow. Glasgow Central 9600. Ext. 2425).
South East Division: Public Health Department, Drayton Hall, West Drayton, Middx. (West Drayton 2275).
South Wales and Monmouthshire Division: 9 Lodge Drive, Baglan, Port Talbot, Glam. (Port Talbot 2244 Ext. 45).
South West Division: St. Clement's House, Marsh Street, Bristol, 1. (Bristol 26241).
West Midlands Division: Public Health Inspector's Office, Municipal Buildings, Old Hill, Staffs. (Cradley Heath 66891).
Yorkshire Division: Public Health Department, 12 Market Buildings, Vicar Lane, Leeds, 1. (Leeds 30211. Ext. 29).

Coal Board, National, Hobart House, Grosvenor Place, London, S.W.1. (Belgravia 2020).

Coal Utilisation Council, 19 Rochester Row, London, S.W.1. (Victoria 2339).

Coal Utilisation Research Association, British, Randalls Road, Leatherhead, Surrey. (Leatherhead 4411).

Coke Distributors' Associations, National Federation of, Terminal House, 52 Grosvenor Gardens, London, S.W.1. (01-730 6120).
Area Offices:
London and Counties C.D.A.: Terminal House, 52 Grosvenor Gardens, London, S.W.1. (01-730 6129).
Midland Counties C.D.A.: Fuel House, 12 George Road, Edgbaston, Birmingham, 15. (021-454 8225).
Northern C.D.A.: 54/55 Bondgate, Darlington, Co. Durham. (Darlington 2832).
North Eastern C.D.A.: West Bar Chambers, 38 Boar Lane, Leeds, 1. (Leeds 33361).
Wales C.D.A.: 4 Dock Chambers, Bute Street, Cardiff. (Cardiff 29649).
Lancashire and District C.D.A.: Whitworth House, 115 Princess Street, Manchester, 1. (Manchester Central 3437).

Coke Oven Managers' Association, 1 Cliff Street, Mexborough, Yorks.

Coke Research Association, British, Chesterfield, Derbys. (Chesterfield 76821).

Combustion Engineering Association, Trident House, Station Road, Hayes, Middlesex. (01-573 1393 and 2967).

Confederation of British Industry, 21 Tothill Street, London, S.W.1. (Whitehall 6711).

Corrosion Technology, Institution of, 33 Ovington Square, London, S.W.3. (Kensington 9649).

Council for the Protection of Rural Wales, (Cymdeithas Diogelu Harddwch Cymru), Meifod, Montgomeryshire. (Meifod 383).

County Boroughs' Association, Guildhall, Kingston-upon-Hull. (Kingston-upon-Hull 36880).

County Councils Association, Eaton House, 66A Eaton Square, London, S.W.1. (Belgravia 5173).

County Councils in Scotland, Association of, 3 Forres Street, Edinburgh. (Caledonian 1626/7).

Derbyshire Clean Air Joint Consultative Committee, Town Clerk's Office, Town Hall, Chesterfield. (Chesterfield 77232).

Domestic Heating Society, Norwich House, 58/62 High Street, Epsom, Surrey.

Domestic Solid Fuel Appliances Approval Council, 4-5 Grosvenor Place, London, S.W.1. (Belgravia 4321).

Electrical Association for Women, 25 Foubert's Place, London, W.1. (Gerrard 5212).

Electrical Engineers, Institution of, Savoy Place, London, W.C.2. (Covent Garden 1871).

Electrical Research Association: Offices, Library and Laboratories, Cleeve Road, Leatherhead, Surrey. (Leatherhead 4151).

Electricity Council, 30 Millbank, London, S.W.1. (01-834 2333).

Forest Products Research Laboratory, Princes Risborough, Aylesbury, Bucks. (Princes Risborough 101–2).

Fuel, Institute of, 18 Devonshire Street, London, W.1. (01-580 7124).

Fuel Technology, College of, 90 Talbot Road, Highgate, London, N.6. (01-340 6972).

Gas Council, 4-5 Grosvenor Place, London, S.W.1. (01-235 4321).

Gas Engineers, Institution of, 17 Grosvenor Crescent, London, S.W.1. (01-245 9811).

Gas Industries, Society of British, 16 Grosvenor Crescent, London, S.W.1. (01-235 5632 and 3940).

Great Britain, Royal Institution of, 21 Albemarle Street, London, W.1. (Hyde Park 5716).

Health Education, Central Council for, Tavistock House, Tavistock Square, London, W.C.1. (Euston 3341).

Health, Ministry of, Alexander Fleming House, Newington Causeway, London, S.E.1. (Hop 5522).

Health, Royal Society of, 90 Buckingham Palace Road, London, S.W.1. (Sloane 5134).

Heating and Ventilating Engineers, Institution of, 49 Cadogan Square, London, S.W.1. (Belgravia 7671/2/3).

Hospital Engineering, Institute of, 15 Cleveland Square, Bayswater, London, W.2. (01-262 7442).

Housing and Local Government, Ministry of, Whitehall, London, S.W.1. (Whitehall 4300). (*See also Alkali Inspectorate*).

Housing Centre Trust, 13 Suffolk Street, London, S.W.1. (01-930 2881).

Institute of Housing Managers, Victoria House, Southampton Row, London, W.C.1. (01-242 3267/8).

Iron and Steel Federation, British, Steel House, Tothill Street, London, S.W.1. (Whitehall 1030).
Iron and Steel Research Association, British, 24 Buckingham Gate, London, S.W.1. (Tate Gallery 7931).

London and Home Counties Clean Air Advisory Council, Health Department, City Hall, Victoria Street, London, S.W.1. (01-828 8070. Ext. 437).
London Boroughs Association, Westminster City Hall, Victoria Street, London, S.W.1. (01-828 8070).
Low Temperature Coal Distillers' Association of Great Britain Ltd., P.O. Box No. 21, Chesterfield, Derbyshire. (Bolsover 2281/9).

Manchester and District Regional Clean Air Council, Town Hall, Manchester, 2. (Manchester Central 3377, Ext. 341).
Mechanical Engineers, Institution of, 1 Birdcage Walk, London, S.W.1. (Whitehall 7476).
Medical Officers of Health, The Society of, Tavistock House South, Tavistock Square, London, W.C.1. (01-387 3923).
Medical Research Council, Air Pollution Research Unit, St. Bartholomew's Hospital Medical College, Charterhouse Square, London, E.C.1. (01-253 1537).
Meteorological Office, London Road, Bracknell, Berkshire. (Bracknell 20242).
Meteorological Office, Weather Centres:
Forecasts, London: Temple Bar 4311.
Glasgow: City 3451.
Manchester: Deansgate 6701.
Newcastle: Newcastle 26453.
Southampton: Southampton 28844.
Meteorological Society, Royal, 49 Cromwell Road, London, S.W.7. (Kensington 0730).
Midlands Joint Advisory Clean Air Council, The Limes, Dudley Road, Sedgley, Staffs.
Municipal Corporations, Association of, 36 Old Queen Street, Westminster, London, S.W.1. (Whitehall 9861).
Municipal Engineers, Institution of, 25 Eccleston Square, London, S.W.1. (Victoria 5082/3).

National Housing and Town Planning Council Incorporated, 11 Green Street, London, W.1. (Mayfair 7107/8).
National Industrial Fuel Efficiency Service, 71 Grosvenor Street, London, W.1. (01-493 9706).
Area Offices:
North Eastern: St. Paul's House, 20/22 St. Paul's Street, Leeds, 1. (Leeds 20046).
44A Great North Road, Newcastle upon Tyne, 2. (Newcastle 813776).
London and South Eastern: 24 Bruton Place, London, W.1. (01-493 7687).
8 Queen Anne Terrace, Gonville Place, Cambridge. (Cambridge 56271).
Wales and South Western: Baltic House, Mountstuart Square, Cardiff. (Cardiff 33825).
9 Great George Street, Bristol, 1. (Bristol 21301).
West Midlands: 6 Harborne Road, Edgbaston, Birmingham, 15. (Edgbaston 4471).
East Midlands: Wellington House, 190 Derby Road, Nottingham. (Nottingham 44753).
North Western: 89 Oxford Street, Manchester, 1. (Manchester Central 9228).
Scotland: 6 Park Terrace, Glasgow, C.3. (Douglas 2453).
49 Meadowside, Dundee. (Dundee 22179).
Northern Ireland: 412 Antrim Road, Belfast 15. (Belfast 76246).
National Trust for Places of Historic Interest or Natural Beauty, 42 Queen Anne's Gate. London, S.W.1. (01-930 0211).

Parliamentary and Scientific Committee, 7 Buckingham Gate, London, S.W.1. (Victoria 2608).
Petroleum, Institute of, Atmospheric Pollution Committee, 61 New Cavendish Street, London, W.1. (Langham 3583).
Power, Ministry of, Thames House South, Millbank, London, S.W.1. (01-222 7000).
Preservation of Rural England, Council for the, 4 Hobart Place, London, S.W.1. (Belgravia 4771).
Protection of Ancient Buildings, Society for the, 55 Great Ormond Street, London, W.C.1. (01-405 2646).
Public Health and Hygiene, Royal Institute of, 28 Portland Place, London, W.1. (Langham 2731/2).
Public Health Engineers, Institution of, 32 Eccleston Square, London, S.W.1. (01-834 3017).
Public Health Inspectors, Association of, 19 Grosvenor Place, London, S.W.1. (01-235 5158/9).

Road Transport Engineers, The Institute of, 1 Cromwell Place, Kensington, London, S.W.7. (Kensington 3744).
Royal Institution of Great Britain, 21 Albemarle Street, London, W.1. (Hyde Park 0669 and 5716).
Rural District Councils Association, 147 Victoria Street, Westminster, London, S.W.1. (01-834 6176/7).

Sanitary Association of Scotland, Royal, 150 St. Vincent Street, Glasgow. (Glasgow Central 6606).
Scottish Counties of Cities Association, City Chambers, Edinburgh. (Caledonian 2424).
Scottish Development Department, 21 Hill Street, Edinburgh, 2. (031-226 5208).
Sheffield and District Clean Air Committee, Town Hall, Sheffield. (Sheffield 26444).
Shell-Mex and B.P. Ltd., Shell-Mex House, Strand, London, W.C.2. (01-836 1234).
Social Service, National Council of, 26 Bedford Square, London, W.C.1. (01-636 4066).
Solid Smokeless Fuels Federation, York House, Empire Way, Wembley, Middlesex. (01-902 5405).
Standing Conference of Co-operative Bodies, Warren Spring Laboratory, Gunnels Wood Road, Stevenage, Herts. (Stevenage 3388).
Stationery Office, Her Majesty's, Atlantic House. Holborn Viaduct, London, E.C.1. (City 9876).
Structural Insulation Association, 32 Queen Anne Street, London, W.1. (01-580 7616).

Technology, Ministry of, Millbank Tower, Millbank, London, S.W.1. (Victoria 2255). See also Building Research Station, Forest Products Research Laboratory and Warren Spring Laboratory.
Tees-side Clean Air Committee, Town Clerk's Office, Municipal Buildings, Middlesbrough. (Middlesbrough 45984).
Town and Country Planning Association, 28 King Street, Covent Garden, London, W.C.2. (01-836 5006).
Town Planning Institute, 26 Portland Place, London, W.1.(Museum 9107/8/9).

Urban District Councils' Association, Palace Chambers, Bridge Street, London, S.W.1. (01-930 4868).

Warren Spring Laboratory, (Ministry of Technology), Gunnels Wood Road, Stevenage, Herts., (Stevenage 3388).
Warwickshire Clean Air Council, Council Offices, Bedworth. (Bedworth 3061).
West Bromwich Clean Air Council, D. G. Hunt, Esq., Secretary, West Bromwich Corporation,

P.O. Box No. 40, Town Hall, Lombard Street, West, West Bromwich.

West Lancashire and Cheshire Regional Smoke Abatement Committee, c/o Health Department, Hatton Garden, Liverpool, 3. (Liverpool Central 8433. Ext. 180).

West Riding Clean Air Advisory Council, Public Health Department, 25 East Parade, Leeds, 1. (Leeds 30661).

Women of Great Britain, National Council of, 36 Lower Sloane Street, London, S.W.1. (Sloane 0619).

Women's Advisory Council on Solid Fuel, The, 18 South Moton Street, London, W.1. (01-629 5358).

Women's Gas Federation and Young Homemakers, 5 Grosvenor Crescent, London, S.W.1. (Belgravia 4321).

Overseas

Argentine

Asociación Argentina Contra la Contaminación del Aire, Juncal 1699, Buenos Aires.

Australia

Clean Air Society of Australasia, P.O. Box 31, George Street North P.O., Sydney, New South Wales.

Dept. of Public Health, Box 65, Rundle Street, Adelaide, South Australia.

Dept. of Health, George Street, Brisbane, Queensland.

Dept. of Health Services, 24 Campbell Street, Hobart, Tasmania.

Dept. of Health, 316 Queen Street, Melbourne, Victoria.

Dept. of Public Health, 57 Murray Street, Perth, Western Australia.

Dept. of Public Health, N.S.W. Air Pollution Control Branch, 86-88 George Street, Sydney, N.S.W.

Austria

Austrian Society of Industrial Medicine, Kinderspitalgasse 15, Vienna, 9.

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Centre Scientifique et Technique de la Construction 5 rue de la Violette, Brussels, 1.

Conseil National Contre la Pollution de l'Air, 6, Place de Martyrs, Brussels.

Society of Health and Social Medicine. Secretary: Professor Graffar, Professor of Social Medicine, Liberal University of Brussels.

Cebedair, 2, rue Armand Stévart, Liége.

Brazil

Associação Brasileira de Prevenção à Poluição do Ar.
Rua Catumb, 318-6° ander, São Paulo, 2.P.7.

Canada

British Columbia Clean Air Association, 2907 West 42nd Avenue, Vancouver 13, B.C.

Dept. of National Health and Welfare. Environmental Assessment Unit Occupational Health Division, 455 Spencer Street, Ottawa 4, Ontario.

Czechoslovakia

Czech Polytechnic University of Prague, Faculty of Mechanical Engineering, Department of Air Engineering, Praha 6, Technická 1902.

Czechoslovak Academy of Sciences, Institut for Physics of the Atmosphere, Praha 4, Spořilov, Boční 11.

Czechoslovak Institut of Physical Chemistry, Department of Physical Chemistry of Aerosols, Praha 2, Máchova 7.

Institut of Hygiene, Praha 10, Srobarova 48.

Power Research Institut, Praha 7, Partizánská 7a.

Research Institut of Air Engineering, Praha 10, Malešice.

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Densk Kedelforening Vesterbrogade I.A., Copenhagen.

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Institute of Occupational Health, Haartmaninkatu 1, Helsinki 25.

Ministry for Internal Affairs, Aleksanterinkatu 3D, Helsinki.

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Association pour la Prévention de la Pollution Atmosphérique. M. Yvan Queret, 62 rue de Courcelles, Paris 8.

Association Technique de l'Industrie du Gaz en France, 62, rue de Courcelles, Paris, 8.

Centre d'Information pour le Développement de Conditionnement d'Air, de la Ventilation, du Filtrage de l'Air et du Dépoussierage, 38 rue Copernic, Paris 16.

Centre Interprofessionnel Technique d' Études de la Pollution Atmosphérique (C.I.T.E.P.A.), 28 rue de la Source, 75 - Paris (XVI^{e}).

Charbonnages de France, 9 Avenue Percier, Paris 8.

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Electricité de France, 11 bis, rue d' Aguesseau, Paris 8.

Institut National d'Hygiène, 11 bis rue de Milan, Paris 9.

Institut Français des Combustibles et de l'Energie, 3 rue Henri Heine, Paris 16.

Institut National de Recherche Chimique Appliquée, 12 Quai Henri IV, Paris 4.

Laboratoire Municipal de la Préfecture de Police, 39 bis rue de Dantzig, Paris 15.

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Union Européenne de Medicine Sociale, 1 rue de Courcelles, Paris 9.

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Deutscher Verein von Gas-und Wasserfachmännern Beethovenstr. 17, Frankfurt (Main).

Federal Ministry of Health, Michaelstr. 10. 532 Bad Godesberg.

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Institut für Technische Physik der Frauenhofer-Gesellschaft, Königstr 70/74, Stuttgart-Degerloch. Dr.-Ing. Reiher, Director.

Institut für Wasser, Boden und Lufthygiene Corrensplatz 1, Berlin 33.

Landesinstitut für Arbeitsschutz und Arbeitsmedizin, Kaiserallee 61, 75 Karlsruhe.

Landesanstalt für Bodennutzungsschutz des Landes Nordrhein-Westfalen, 4300 Essen, Eststr. 160.
Ruhrkohlen-Beratung GmbH, Frau-Bertha-Krupp-Str. 4, Essen.
Staubforschungsinstitut des Hauptverbandes der Gewerblichen Berufsgenossenschaften e.V. Langwartweg 103, Bonn. Prof. Winkel, Director.
Steinkohlenbergbauverein, Friedrichstr 2, Essen 1. Prof. Weissner.
Technischer Überwachungs-Verein Essen e.V. Steubenstr. 53, Essen 1.
Verein Deutscher Eisenhüttenleute, Breite Strasse 27, Düsseldorf.
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Vereinigung der Grosskesselbesitzer e.V. Kurfürstenstr. 27, Essen 1.

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Central Public Health Engineering Research Institute, 70-71 Civil Lines, Nagpur.

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Public Council for the Prevention of Noise and Air Pollution, Tel-Aviv, P.O. Box 20127.

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Consiglio Nazionale delle Ricerche Pizzale delle Scienza 7, Rome.
ILVA Society, Via Corsica 4, Genoa.
Institute of Hygiene, University of Ferrara, Corso Giovecca 173A, Ferrara.
Institute of Hygiene, University of Genoa, Via A. Pastore 1, Genoa.
Instituto di Ingegneria Sanitaria del Politecnico di Milano, Piazza Leonardo da Vinci 32, Milan.
Instituto Superiore di Santia, Viale Regina Elena 299, Rome.
Stazione Sperimentale per i Combustibili, Via De Gasperi 3, Milan.
NANS (Union of Nations for Fight against Noise and Smog) via Garibaldi, 25, Turin.

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The Institute of Public Health, 1-39, Shiba Shirogane Daimachi, Minato-ku, Tokyo.
Kanto-Shin-Etsu Heat Control Society, 54 Takata-Oimatsu-cho, Bunkyo-ku, Tokyo.
Osaka Institute of Hygiene, 38 Kitaogimachi, Kita-Ku, Osaka.

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National Society for Clean Air of Malta, 8-10 Civic Centre, Senglea.

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Instituto de Geofisica, Torre de Ciencias, Ciudad Universitaria, Mexico 20.

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Atmospheric Pollution Division; 14 Duinweg, The Hague.
Central Organization/Applied Scientific Research T.N.O., Committee for Industrial Air Pollution, 12, Koningskade, The Hague.
Commission for Soil, Water, and Air, Baan 170, Rotterdam.
Council for Air Pollution, Zeestraat 73, The Hague.
Netherlands Association for Water, Soil and Air Pollution, Nienwe Achtergracht 100, Amsterdam.
Research Institute for Public Health Engineering T.N.O., (Organization for Health Research T.N.O.) Industrial Air Pollution Division, 97, Schoemakerstraat Delft.
Stichting Concawe (For conservation of clean air and water from oil refinery activities in Western Europe). 700 van Alkemaadelaan, The Hague. Secretary: Mr. G. P. Liedmeier.

Norway

Institute of Hygiene, University of Oslo, Blindern, Oslo.
Røykskaderädet, Meltzersgt 4, Oslo Dep. Oslo 1.

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Air Pollution Control, Central State Board for National Water Economy, ul. Swietokrzyska 12, Warsaw.
Polish Academy of Sciences, ul. Hagera 17, Zabrze.

Portugal

Instituto Superior Ciencias, Sociais Universidade Técnica, Lisbon.

South Africa

National Physical Laboratory of the Council for Scientific and Industrial Research. Box 395, Pretoria, Transvaal.

Spain

Municipal Institute of Hygiene, Place de Lesseps 1. Barcelona.

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AB Svenska Fläktfabriken, Kungsgatan 18, Stockholm.
Institutet för Vatten-och Luftvårdsforskning, Drottning Kristines väg 47 D, Stockholm.
National Institute of Public Health, Stockholm 60.
Swedish National Committee for Air Purification, Sveavärgen 166 XI, Stockholm.

Switzerland

Eidgenössische Kommission für Luftthygiene, Kreuzstrasse 26, 8008 Zürich.

U.S.A.

Air Pollution Control Association, 4400 Fifth Avenue, Pittsburgh, 13 Pa.
Air Pollution Foundation, 2556 Mission Street, San Marino, California.
Bay Area Air Pollution Control District, 1480 Mission Street, San Francisco 3, California.
Bituminous Coal Research Inc., 35 Hochberg Road, Monroe, Pittsburgh 13, PA.
California State Motor Vehicle Pollution Control Board, 217 W. First Street, Los Angeles 12, California.
Los Angeles County Air Pollution Control District, 434 S. San Pedro Street, Los Angeles 13, California.
New York Dept. of Air Pollution Control, 15 Park Row, New York 38 N.Y.
Robert A. Taft Sanitary Engineering Centre, 4676 Columbia Pky., Cincinatti 26, Ohio.
U.S. Dept. of Health, Education and Welfare, Public Health Service, Division of Air Pollution, DHEW Building South, Washington 25, D.C.

U.S.S.R.

Institute of Communal Hygiene, Pogodinskaja 10, Moscow.
Medical Control Committee on Air Pollution, State Medical Commission, Moscow.
State Committee on Chemistry, Moscow.

World Health Organization

Division of Environmental Sanitation, Palais des Nations, Geneva, Switzerland.
Regional Health Officer, Office for Europe, 8 Scherfigsvej, Copenhagen, Denmark.

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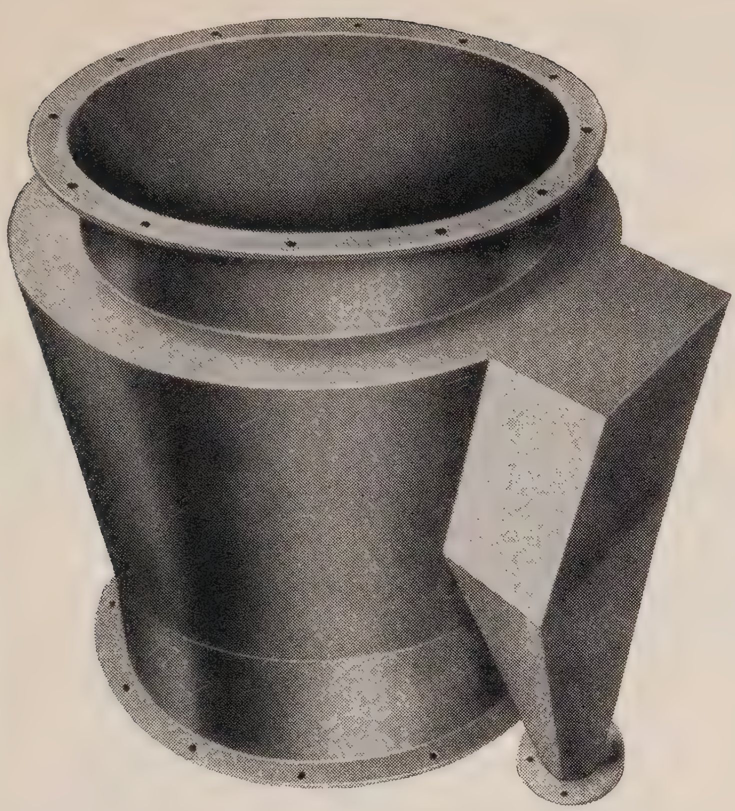

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& Romiley, Brierfield, Bucklow, Burnley, Bury, Buston, Chadderton, Cheadle & Gatley, Cheshire C.C., Chester, Chorley, Church, *Clitheroe*, Colne, Connah's Quay, Crewe, Crompton, *Crosby*, *Cumberland C.C.*, Darwen, Denton, Droylsden, Dukinfield, Eccles, Ellesmere Port, Failsworth, Farnworth, Fleetwood, Flint, Fulwood, Glossop, Golborn, Great Harwood, Hale, Haslingden, Haydock, Hazel Grove & Bramhall, Heywood, Hindley, Horwich, *Hoylake*, Huyton-with-Roby, Hyde, Ince-in-Makerfield, Irlam, Kearsley, Kirkby, Lancashire C.C., Lancaster, Lees, Leigh, Leyland, Littleborough, Liverpool, Longdendale, Macclesfield, Manchester, Marple, Matlock, Middleton, Middlewich, Mold, Morecambe & Heysham, Nantwich, Nelson, Newton-le-Willows, Northwich R.D.C., Northwich U.D.C., Oldham, Ormskirk, Padiham, Preston, Preston R.D.C., Prestwich, Radcliffe, Ramsbottom, Rawtenstall, Rhyl, *Rishton*, Rochdale, Royton, Runcorn R.D.C., Runcorn U.D.C., St. Helens, Sale, Salford, Skelmersdale, *Southport*, Stalybridge, Standish-with-Langtree, Stockport, Stretford, Swinton & Pendlebury, *Thornton Cleveleys*, *Tintwistle*, Tyldesley, Up Holland, Urmston, Wallasey, Warrington, *Warrington R.D.C.*, *West Lancashire*, Whiston, Whitefield, Whitworth, Widnes, Wigan, Wilmslow, Winsford, Workington, Worsley, Wrexham, Wrexham R.D.C.

North East Division

Ashington, Barnard Castle, Bedlingtonshire, Billingham, Bishop Auckland, Blaydon, Brandon & Byshottles, Castle Ward, Chester-le-Street R.D.C., Chester-le-Street U.D.C., Consett, Crook & Willington, *Darlington*, Durham, Eston, Felling, Gateshead, Gosforth, Hartlepool, Hebburn, Hetton, Houghton-le-Spring, Jarrow, Lanchester, Longbenton, Middlesbrough, Newburn, Newcastle-upon-Tyne, Northumberland C.C., Prudhoe, Redcar, Ryton, Saltburn & Marske-by-the-Sea, Seaham, Sedgefield, Shildon, Skelton & Brotton U.D.C., South Shields, Spennymoor, Stanley, *Stockton-on-Tees*, Sunderland, Thornaby-on-Tees, Tynemouth, Wallsend, Washington, Whickham, Whitlay Bay.

Yorkshire Division

Adwick-le-Street, Aireborough, Batley, Bentley-with-Arksey, Bingley, Bradford, Bridlington, Brighouse, Castleford, Colne Valley, Conisbrough, Cudworth, Darton, Dearne, Denby Dale, Dewsbury, Doncaster, Doncaster R.D.C., Elland, Halifax, Harrogate, Hackmondwike, Hemsworth R.D.C., Hemsworth U.D.C., Hepton, Holmfirth U.D.C., Horbury, Horsforth, Hoyland Nether, Huddersfield, Ilkley, *Keighley*, Kingston-upon-Hull, Knottingley, Leeds, Melthem, Mexborough, Mirfield, Morley, Normanton, North Riding C.C., Ossett, Otley, Pontefract, Pudsey, Queensbury & Shelf, Rawmarsh, Rotherham, Rothwell, Royston, *Scarborough*, Sheffield & District Clean Air Committee, Shipley, Skipton, Sowerby Bridge, Spenborough, Stanley, Swinton, Thorne, Todmorden, Wakefield, Wakefield R.D.C., Wath-upon-Dearne, Wombwell, Worsbrough, Wortley, *York*.

West Midlands Division

Aldridge-Brownhills, Atherstone, Bedworth, Birmingham, Burton-on-Trent, Cannock R.D.C., Cannock U.D.C., Coventry, Dudley, Halesowen, Hereford, Kidderminster, Leamington Spa, Lichfield, Meriden, Newcastle-under-Lyme, Nuneaton, Redditch, Rugby, Rugeley, *Seisdon*, Solihull, Stafford, Staffordshire C.C., Stoke-on-Trent, Stone, Sutton Coldfield, Walsall, Warley, Warwick, Warwick R.D.C., *Warwickshire C.C.*, *Wellington*, West Bromwich, Wolverhampton, Worcester.

East Midlands Division

Alfreton, Basford, Beeston & Stapleford, Belper, Bingham, Blaby, Blackwell, Bolsover, Boston, *Cambridge*, Carlton, Chesterfield, Chesterfield R.D.C., Clay Cross, Clowne, Coalville, Corby, Derby, Dronfield, Eastwood, Gainsborough, Glanford Brigg, Grantham, Great Yarmouth, Grimsby, Heanor, Hinckley, Ilkeston, Ipswich, Irthlingborough, Kettering, King's Lynn, Kirkfield-in-Ashfield, Leicester, Lincoln, *Lincoln C.C.* (*Parts of Kesteven*), Long Eaton, Loughborough, Lowestoft, Mansfield, Mansfield Woodhouse, Newark, Norwich, Nottingham, *Nottinghamshire C.C.*, Old Fletton, Peterborough, *Repton*, Ripley, Rushden, Scunthorpe, Southwell, Staveley, Sutton-in-Ashfield, Swadlincote, *Wellingborough*, West Bridgford, Wisbech, Worksop, Worksop R.D.C.

South West Division

Bath, *Bathavon*, *Bridgwater*, Bristol, Cheltenham, Dursley, Gloucester, *Keynsham*, Kingswood, Lydney, *Mangotsfield*, *Norton-Radstock*, *Poole*, *Shepton Mallet*, *Sherborne*, *Sodbury*, Stroud, Swindon, *Tetbury*, *Tewkesbury*, Thornbury, *Weston-super-Mare*, West Penwith, Weymouth & Melcombe Regis.

South East Division

Amersham, Aylesbury, Barking, Barnet, Basildon, Bedford, Bedfordshire C.C., Bexley, Bishop's Stortford, Bletchley, *Bognor Regis*, *Bournemouth*, Braintree, Brent, Brentwood, Brighton, Bromley, Bullingdon, Bushey, Camden, Chatham, Chesham, Cheshunt, Chigwell, *Clacton*, Crawley, *Croydon*, *Cuckfield*, Dartford, Dartford R.D.C., Dover, Ealing, Eastbourne, Easthampstead, Eastleigh, Egham, Elstree, Enfield, Epping & Ongar, Epsom & Ewell, Esher, *Essex C.C.*, Eton, *Farnborough*, Folkestone, Gillingham, *Gosport*, Gravesend, Greater London Council, Greenwich, Guildford, Guildford R.D.C., Hackney, Hammersmith, Harlow, Harrow, Hastings, Havant & Waterloo, Havering, Hemel Hempstead, High Wycombe, Hillingdon, Hitchin, Hoddesdon, Horsham, Hounslow, Hove, *Kensington & Chelsea*, *Kent C.C.*, Kingston-upon-Thames, Lambeth, *Leatherhead*, Lewisham, *Littlehampton*, London, City of, *Luton*, Maidenhead, Merton, New Forest, *Newham*, Northfleet, Oxford, *Portsmouth*, *Reading*, Redbridge, *Reigate*, Richmond-upon-Thames, Rickmansworth, Rochester, St. Albans, Sittingbourne & Milton, Slough, *Southampton*, *Southend-on-Sea*, Southwark, Southwick, Staines, Strood, Sutton, Thurrock, Tower Hamlets, *Tunbridge Wells*, Watford, Watford R.D.C., Westminster, Windsor, Windsor R.D.C., *Worthing*, Wycombe.

South Wales & Monmouthshire Division

Abercarn, Aberdare, Abertillery, Barry, Bedwas & Machen, Bedwellty, Bridgend, Caerleon, Caerphilly, Cardiff R.D.C., Cwmbran, Ebbw Vale, Gellygaer, Glamorgan C.C., Llanelly, Llanelly R.D.C., Llantrisant & Llantwit Fardre, Magor & St. Mellons, Merthyr Tydfil, Monmouthshire C.C., Mountain Ash, Mynyddislwyn, Neath, Newport, Penarth, Pontypool, Pontypridd, Port Talbot, Rhondda, Swansea, Tredegar, Ystradgynlais.

Overseas

Durban (South Africa), Geleen (Netherlands), Johannesburg (South Africa), Leichhardt (Australia), *Newcastle* (Australia), *Vereeniging* (South Africa).

36th ANNUAL REPORT

for 1966

The International Congress

THE principal event of the year for the Society was the International Clean Air Congress it organized on behalf of the International Union of Air Pollution Prevention Associations, which was held in London in October. The Society, as one of the six founder members of the International Union, had been honoured by being asked to act as host organization for the first of the congresses to be held at four yearly intervals by the new Union. This was regarded as an honour to the Society, and it gladly undertook to organize the congress and the accompanying exhibition.

The primary purpose of the congress, apart from the bringing together of air pollution workers from all parts of the world, was the presentation and discussion of papers. Well over a hundred were proposed, and 91 were accepted and printed in the volume entitled "Proceedings, Part I". The total number of delegates was 1,246, which included 340 from 30 overseas countries. There were six sessional periods, from the morning of Tuesday, 4 October, to the afternoon of Thursday the 9th, all of which were very fully attended.

On the Friday there were twelve visits of technical interest, attended in all by 230 delegates, some of whom travelled as far afield as South Wales and the New Forest. In the hall adjoining the congress hall was staged a comprehensive clean air exhibition, with 44 exhibitors. The overall variety and quality of design proved to be of intense interest to the many visitors.

Lastly, and certainly not least in their value in creating friendship and understanding, were the excellent and enjoyable social occasions. These are described in the Winter, 1966, issue of *Smokeless Air*, where acknowledgements were gratefully made to the member organizations that so generously offered their hospitality and provided essential services.

The organization of the congress and exhibition gave a great deal of additional work to the Society's conference committee and to its staff. With the exception of additional editorial assistance in the production of the *Proceedings*, the number of staff was not increased for what proved to be the biggest operation it had undertaken.

The Annual General Meeting

The annual general meeting, followed by the customary luncheon, was held in London on 9 May. The guest of honour at the luncheon was Robert Mellish, M.P., Joint Parliamentary Secretary, Ministry of Housing and Local Government. Mr. Mellish, whose interest in clean air is very real and much appreciated, gave an encouraging address, which was reported in full in the Summer, 1966, issue of *Smokeless Air*. One of his statements, which should not be overlooked by certain local authorities, may be quoted again:

> "A word about the future. Let me nail the Government's colours to the mast. We are determined to continue the process of ridding our black areas of smoke; we hope this will be achieved voluntarily. If not, it ought to be plain to all that this nation cannot afford to treat the air we breathe as a cesspool."

And finally he said:

> "I conclude by saying to you, Sir, and to your colleagues here, as one who has become interested in your subject as a result of the job I have had in this last 18 months, that my Government, and my Minister, will do what they can to back up this Society, who have done, and are doing, a first-class job for Britain."

Following the morning A.G.M. and the luncheon there was held in the afternoon an open meeting to celebrate the tenth anniversary of the Clean Air Act. The guest speakers were Sir Hugh Beaver, and Sir Gerald Nabarro, M.P. Other speakers were Dr. J. L. Burn, a former chairman of the Society's Council and a member of the Beaver Committee, and E. M. Birtwisle. The latter, as chairman of the Society's Parliamentary and Local Government Committee, gave a report on the views of the committee on possible revisions to the Clean Air Act.

Council and Committees

The Executive Council met at regular intervals during the year, but the work of some of its committees had to be slowed down for the time being because of the demands made by the organization of the International Congress. The Conference Committee of course met more frequently than usual. One of the most important committee activities in progress is a study being made by the Technical Committee on air pollution from road vehicles. Work on this was resumed as soon as the congress was over, and it is expected that its report will be completed and published in the early part of 1967. Mention should be made of the retirement from the chairmanship of this committee of Dr. J. S. G. Burnett, who had occupied the post for a number of years. The thanks of the committee, and of the Executive Council, are extended to Dr. Burnett for the valued service he gave.

The Society's own offices have no room large enough for meetings of the Executive Council, which have therefore to be held in other premises. During the year the Council had the privilege of meeting in the council or board rooms at the headquarters of some of its larger corporate members, namely at the offices of the Gas Council, the National Coal Board, Shell International, and the Electricity Council. This hospitality is very much appreciated.

The Divisions

Divisional reports will follow this report when it is published in the 1967-68 edition of the *Clean Air Year Book*. They will again show a record of considerable useful activity, through which the subject of clean air is not only kept actively before members of the Society, but is advanced in the regions and localities within the regions, by the valuable practice of holding meetings and visits in different places. Once again gratitude must be expressed to the honorary officers of the Divisions, and especially to the honorary secretaries, for their important services to the movement.

Publicity, Publications and Information

The Society's information and library services have continued to be called upon to an increasing extent, both for members and non-members, in this country and overseas. Apart from Congress visitors, there were personal calls by visitors from a number of overseas countries including Brazil, France, Germany, Sweden, Canada and Czechoslovakia, and much information or advice has been sought for and given. The International Congress has created new links with co-workers in air pollution in many parts of the world.

Press releases on the Society's activities and publications have led to much helpful publicity, and approximately 750 press cuttings referring to the Society by name were received during the year. The total number of press cuttings received, a number coming from abroad, was over 5,500. In addition there has been a welcome increase in radio and TV attention to clean air, with 27 known programmes dealing with the subject in one form or another.

The Society participated, with information stands, at the exhibitions of the Royal Society of Health, in April, and the Public Health Inspectors' Association, in September.

A demand for photographs of air pollution subjects, mostly to illustrate press articles and for exhibition purposes, continues and efforts are being made to secure new subjects that are both up-to-date and of good visual interest. Some subjects, such as for example pollution from steam locomotives, are becoming obsolete—a sign of the progress continually being made.

Membership and Finance

The annual accounts will reveal, for the first time for a number of years, a small excess of expenditure over income. This is due in part to the costs of the International Congress, to a revision of the Society's pension scheme, and to a fall in advertising revenue, common at the present time to most publications. There has been a little falling off of membership subscriptions and donations, especially from corporate members affected by the prevailing economic situation.

Membership generally, however, has remained gratifyingly steady, and appreciation to all members must be recorded. As has been said before, the Society is unlike some organizations in that it devotes most of its energies to the pursuit of the objectives for which it exists, and in consequence is apt to neglect the getting of increased funds. The Executive Council has however, set up a small sub-committee to consider ways and means for increasing membership and more substantial donations. In the meantime all members are asked to use their efforts towards these objectives.

Field House,
Breams Buildings,
London, E.C.4.

JAMES GOODFELLOW, *Chairman.*
STANLEY E. COHEN, *Hon. Treasurer.*
ARNOLD MARSH, *Director.*

Scottish Division

The Annual General Meeting and Conference of the Scottish Division was held in Dundee from 18-20 May, 1966. At the Annual General Meeting on 18 May, Mr. John Foreman, Chief Sanitary Inspector, Dundee, was appointed President of the Division, Councillor William Monteith, Glasgow, having demitted office. The new President paid tribute to Councillor Monteith's long and distinguished service to the Society as Vice-President of the Division from 1954 to 1963 and President from 1963 to 1966 and also his membership of the National Executive Council of the Society for eleven years. Councillor Monteith was unable to be present owing to ill health but the Hon. Secretary was instructed to write to him conveying the appreciation of the members for his services to the Society. Councillor David M. Wardley, Glasgow, was appointed Vice-President.

On the first morning of the conference, which was held in the Marryat Hall, City Square, Dundee, Lord Hughes, Parliamentary Under-Secretary of State, Scottish Office, gave an address on "Clean Air—Prospects for the Future" and this was followed by two addresses—one by Mr. J. N. Tweedy, Nuclear Operations Engineer, South of Scotland Electricity Board, on "Nuclear Generation" and the other by Mr. W. C. Hopper, British Petroleum Co. Ltd. on "North Sea Gas".

At the afternoon session papers were given by Mr. R. R. A. Pride, District Alkali Inspector, Scottish Development Department, and Mr. Ian MacPherson, Technical Officer, Health and Welfare

Department, Glasgow, on "Modern Industry and its Air Pollution Problems" and "Glasgow's approach to Domestic Smoke Control", respectively. The forenoon session on Friday, 20 May, was devoted to talks by representatives of the various fuel interests on "Domestic Space Heating—Trends in Appliances".

The Division was grateful for the excellent hospitality given by Dundee including a civic luncheon and a bus trip round the city. Most delegates were of the opinion that the conference was a lively and interesting one. Dundee is to be congratulated, too, on the progress they are achieving on clean air.

During 1966, the Division met on two occasions and the Executive Committee held six meetings. A new constitution for the Division was approved and following a request from Headquarters, certain revisions or additions were suggested to the Clean Air Act, 1956. A memorandum was forwarded to the Royal Commission on Local Government in Scotland and two of the recommendations that were made to the Commission were that in the event of a two-tier system of Local Government being introduced, careful consideration should be given as to which local authority should be charged with the enforcement of clean air matters, and it was suggested that there should be no delegation from one authority to another. The second recommendation made was that the Commission might also wish to consider that the permissive provisions in the Clean Air Act with regard to the establishment of Smoke Control Areas should now be made obligatory.

Concern must again be expressed regarding the high cost of solid smokeless fuel in Scotland compared with other parts of the United Kingdom. Inevitably, this is having a decided effect on the speed with which smoke control areas are being set up.

J. W. TRAILL, *Hon. Secretary & Treasurer*

Northern Ireland Division

The major event of the year was the Spring Meeting held in May in the Town Hall, Portadown. The Borough Council of Portadown was most helpful and co-operative and the Division is greatly indebted to the Mayor, Councillor R. J. Williamson, J.P., who gave an official welcome and provided hospitality, and to the Town Clerk, Mr. George Magowan for the excellent arrangements which were made. Mr. A. H. Bannerman, Chief Architect/Planner to the Craigavon Development Commission presented an excellent paper at the morning session on "Town Planning and Environment" and at the afternoon session Mr. G. O. Allen, Chief Public Health Inspector in the Borough of Scunthorpe presented a most interesting paper on "Smoke Control" which was followed by a lively discussion. There was a large attendance of representatives from Government Departments, Local Authorities, other public bodies, industrial and professional organizations.

Early in the year the Ministry of Health and Social Services issued a circular to local authorities asking them to give urgent consideration to the domestic smoke problem within their districts. Local authorities were asked to prepare a phased programme for establishing smoke control areas over the next five years and to advise the Ministry of their conclusions. It is understood that a number of local authorities are interested in Clean Air and concerned about the level of pollution in their areas and have submitted definite proposals.

Towards the end of the year Castlereagh Rural District Council brought their first Smoke Control Order into operation in the Dundonald area of the Rural District. This was the first Smoke Control Order to be made in Northern Ireland and the Council are to be congratulated on this achievement. The area subject to smoke control is fairly large and when present housing developments are completed there will be over 3,000 houses within it.

It was most encouraging to learn that Belfast Corporation has decided to make a number of areas in the City smokeless and the Division would wish the Members of the Corporation and their Officers every success in this tremendous undertaking.

W. E. C. O'BRIEN, *Hon. Secretary*

North-East Division

During 1966 the Division held two meetings. The Annual General Meeting was held in April in the Zetland Hotel, Saltburn by the Sea, on which occasion the Chairman in his usual annual address surveyed the progress of pollution abatement measures in the North-East. He stressed the serious position arising from the marked lack of progress in smoke control in the region and compared it most unfavourably with other regions. He referred at length to the difficulties of solid smokeless supplies in this particular area and once more re-affirmed his conviction that there should be a more realistic apportionment of the costs of smoke control between local authorities and the Exchequer. The annual election of officers resulted in the re-election *en bloc* of all those in office.

The business of the annual meeting was followed by an address, dealing with oil-fired central heating, delivered by Mr. R. D. L. Symes, the Area Sales Manager of Shell-Mex and B.P. Ltd. The speaker outlined the development of the oil industry in this country, particularly in relation to the domestic field, and his points were illustrated by a coloured film which gave a pictorial account of the principles of central oil fuel storage and distribution. After the film Mr. Symes and Mr. R. B. Cutts of Shell-Mex and B.P. Technical Services, dealt expertly with the many points raised by the audience. At the conclusion of the discussion Mr. F. G. Sugden, Chief Public Health Inspector of Sunderland C.B., proposed a vote of thanks to Shell-Mex and B.P. Ltd., for the excellent arrangements made for delegates particularly in connection with the tour of Teesport conducted earlier that day.

In July the second meeting was held in the Department of Civil Engineering of the University of Newcastle upon Tyne, when 45 members were present. On this occasion the Honorary Secretary, Mr. L. Mair, delivered an address entitled "The Past History and Present Problems of Smoke Control Areas" in which he dealt with the development of the "smokeless zone" idea of 1936 and the provisions of local acts to implement these principles. In deploring the outstanding failure to achieve the progress envisaged in the Beaver Committee Report, he pointed out that the most backward area was the northern region. By means of a number of graphs he showed that the northern region was generally behind the rest of the country and that, although this inactivity could to some extent be attributed to the "fuel crisis" of 1963, the main cause was the apathy of local authorities. His address, which was delivered in frank and forthright terms, provoked an animated discussion at the conclusion of which three films were shown dealing with clean air subjects. An expression of thanks was then offered to the Vice-Chairman, Professor P. C. G. Isaac of the Department of Civil Engineering in the University, who had kindly arranged the venue for the meeting and provided refreshments for members.

Although throughout the year a general interest in air pollution abatement was sustained, it would be more encouraging if local authorities in the North-East took more practical steps to reach a level of progress commensurate with the rest of the country. It is hoped that the next annual report will be more encouraging.

L. MAIR, *Hon. Secretary & Treasurer*

North-West Division

The Annual General Meeting of the North-West Division was held at the Hollinwood Factory of Messrs. Ferranti Ltd., on Tuesday, 19 April, 1966. Members of the Division were entertained to luncheon by Messrs. Ferranti Ltd.

The Divisional Council met on three occasions during the year. The first meeting was held in June at the headquarters of the North Western Gas Board, Altrincham; at this meeting Mr. Alan Taylor of the N.C.B. was elected Chairman of the Division; Miss N. Kenyon of the Electrical Women's Association, was elected Vice-Chairman; Mr. W. E. Pollitt was elected Honorary Secretary and Mr. H. Clusky was elected Honorary Treasurer.

The members of the Division were entertained to luncheon by the North Western Gas Board at their Partington Gas Plant and Mr. Churm of the Gas Board explained to members some aspects of Natural Gas, with the use of films.

Speakers were provided from the Division on three occasions during the year in response to requests from a school, a ratepayers' association and a church group. Literature on clean air was provided to a Teachers' Training College and local organizations.

There were two meetings of the Publicity Sub-committee during the year but little progress was made in the matter of the proposed Essay Competition, as the necessary assurance of financial backing of the project had not been received from National headquarters.

There was no joint meeting during the year with the Institute of Fuel. No request for such a meeting was received; this was probably due to the poor support at the last meeting held in November, 1965, when we experienced thick fog which prevented members from attending.

Progress in the Clear Air programmes of local authorities went steadily forward in the black areas of the Division and there was also interest shown by some Local Authorities not in black areas. This of course is very encouraging.

It is encouraging to note that there are authorities within the North-West Division who are now within sight of completion of their whole programme.

It was thought that Circular 42/66 which related to public expenditure and suggested that Clean Air may require special permission, would slow down the progress of smoke control but enquiries made of the Ministry of Housing and Local Government inform us that this is not intended.

Let us then press forward with our important task of clearing the air of not only the "Black Area" but the whole of the country not only by means of control areas but also by means of legislation to control other forms of atmospheric pollution such as diesel smoke, emissions of grit and fumes from industrial processes.

With the continued support of all the members of the Division, Local Authority Members, Private Members and Members from Industry we shall obtain that for which we work, a smoke-free atmosphere.

W. E. POLLITT, *Hon. Secretary*

Yorkshire Division

During the year the Divisional Council held three meetings in Leeds and one in Huddersfield, and also made a special visit to Dudley, Worcs.

The first meeting in Leeds was of a formal business nature and this was followed on 17 May by a visit to the Hunslet Engine Works, Leeds, where locomotives have been made since 1864. Of particular interest to members were the "Hunslet" diesel locomotives, both for surface and underground work.

On 13 June a further meeting was held in Leeds and members were shown two new films, one of which dealt with Central Oil Storage Heating and the other "The River Must Live" dealt with river pollution.

The Council visited the Turnbridge works of W. C. Holmes & Co. Ltd., in Huddersfield and saw the manufacture of dust collecting equipment and Electrostatic Precipitators.

At the special invitation of G. W. B. Boilers Ltd., the Council visited their boiler works at Dudley where various models of this firm's products were seen working under experimental conditions.

The press have given this Division very satisfactory publicity during the year, both of our meetings and visits and also on the general question of smoke control.

JAMES GOODFELLOW, *Hon. Secretary*

West Midlands Division

1966 was a year of upheaval in the West Midlands consequent upon the West Midlands Review Order. Fourteen Councils, who were valued members of this Division, ceased to exist and we also lost the services of Councillor E. B. Gibbons, J.P., our Vice-Chairman, upon his leaving the district.

Whilst on the subject of the West Midlands Review Order, I think it is appropriate to refer to the excellent support given to the Division over the years by so many of the authorities who now no longer exist. Due acknowledgment of their support was made at the Annual General Meeting which was held in June at the Ollerton Works of the National Carbonising Company Limited. This meeting, one of the most successful held in recent years, consisted of a tour of the new carbonizing plant, followed by an address by Mr. E. Tate, Sales Manager, on the Sale and Distribution of Rexco, and Mr. J. Kershaw on the Rexco carbonizing process.

The Autumn Sessional Meeting consisted of a visit to the Shell Refinery at Stanlow.

Both firms made most excellent arrangements for the meetings and provided members with a wealth of technical information.

It has been the policy of the Divisional Council in recent years to ensure that all visits and meetings are of a technical nature and this policy has proved most rewarding.

Recognizing the need to make the public at large aware of the evils of air pollution in its various forms and to take effective action to correct misconceptions of clean air policy, the Divisional Council set up a Publicity Sub-Committee. Although these are early days in which to comment on the activities of this committee, it should do much to condition our citizens in the West Midlands for the necessity for vigorous action to ensure clean air in our time.

W. L. KAY, *Hon. Secretary*

East Midlands Division

The Divisional Council continued to urge local authorities to press on with the establishment of Smoke Control Areas. Progress in the Division, however, was very slow and it was estimated that after ten years of the operation of the Clean Air Act, 1956, only 25 per cent of the premises in the "Black Area" of the Division were subject to smoke control. It is hoped that local authorities will take more active steps to implement the provisions of the Act.

General meetings were held at two centres, namely—

Kirkby-in-Ashfield — 30 *March*. The Chairman of the Urban District Council (Councillor C. E. Sargent, J.P.) gave an official welcome to the members. One party toured the underground workings of Kirkby Colliery and a second party was conducted over the new drift mine. Of much interest was the scheme of landscaping the colliery waste tip covering many acres of land and the grassing of the tip's surface. Mr. C. S. Buchan, Chief Engineer, No. 4 Area, N.C.B., addressed the meeting on "The Clean Air Act and Collieries" and Mr. J. Henry Barratt, M.T.P.I., F.R.G.S., Deputy County Director of Planning, Nottinghamshire County Council presented a paper entitled "Spoil Tips and Landscaping".

Leicester—5 *July*—A civic welcome was extended to the members by the Lord Mayor of Leicester (Councillor Mrs. M. M. Trotter). Councillor W. Everett was appointed Divisional Chairman for 1966-67 and Mr. J. F. Edwards, Deputy Chairman. A paper entitled "Ten years of the Clean Air Act" was presented by Mr. I. W. Barker, Divisional Public Health Inspector.

A. WADE, *Hon. Secretary*

South West Division

The work of the Divisional Council for 1966 can be summarized as being of the nature of consolidation after the formation of the Divisional machinery. Several new members have been registered, the most noteworthy perhaps being that of Swindon Borough. A Northern Area Committee has been duly formed and subsequent to a very successful Symposium on Air Pollution and an Exhibition, organized jointly by the Borough of Poole and the Poole and District Technical Group, it is anticipated that a Southern Area Committee within the Division eventually will be formed.

An interesting programme is being actively pursued for 1967.

G. W. DHENIN, *Asst. Hon. Secretary*

South East Division

Steady progress in establishing Smoke Control Areas in the Division was maintained. Circular 42/66 on Public Expenditure might have been expected to cause the faint-hearted to waver but did not, in fact, do so. Reports have been received of only three authorities in the Division who, as a result of the circular, have modified or delayed their smoke control programmes.

In view of the large amount of additional work which fell on Headquarter's staff as a result of the International Clean Air Congress and Exhibition, the Divisional Council offered their services and, in the period immediately before the Congress, were able to relieve the permanent staff of some of their more mundane tasks.

The Divisional Council met four times during the year and three General Meetings were held.

In January, Sir Humphrey Browne, Deputy Chairman of the National Coal Board, addressed a well-attended meeting on "Coal and Clean Air—Co-existence". At a meeting in March the subjects were (a) Prevention of Acid Smuts and (b) The use of fuel additives in reducing sulphur dioxide. The speakers were Dr. P. S. Dewey, Chief Chemist of Sir Michael Thomas (Chemicals) Ltd., Mr. A. E. Lock, of Associated Electrical Industries and Mr. K. A. Cutress, of D.C.P. Systems Ltd. On the conclusion of Divisional business at the Annual General Meeting in November, a talk was given by Dr. R. S. Edwards, C.B.E., member of the Gas Council, on "The Impact of North Sea Gas on Clean Air Progress".

During the year, five very successful visits were made to places of interest:—

1. Housing estates with oil fired central heating (i) with centralized storage and (ii) with individual storage.
2. The B.P. Refinery at Isle of Grain, Kent.
3. Dungeness Nuclear Power Station, Kent.
4. National Coal Board, Coal Research Establishment, Stoke Orchard, Cheltenham.
5. Coal-fired district heating scheme at Rowlatts Hill, Leicester.

We are most grateful to the organizations or bodies concerned, for the facilities and hospitality which made these visits so enjoyable and instructive.

Several requests for speakers to address meetings in the Division were met and the film "Clean Air", which was presented to the Division by Shell Mex and B.P., was loaned on six occasions.

J. S. HODGINS, *Hon. Secretary*

Information About the Society

The forerunners of the Society were the Coal Smoke Abatement Society, established in London in 1899, the Smoke Abatement League of Great Britain (1909) concerned mainly with the Provinces, and the National Smoke Abatement Society, formed in 1929 by the amalgamation of the two parent organizations. At a Special General Meeting held in April 1957, it was agreed unanimously to change the name of the Society to "National Society for Clean Air", and to seek incorporation as a company limited by guarantee, a licence being sought from the Board of Trade to omit the word limited. The Society assumed its new name and status as from 1st January, 1958. For further information about membership, Executive Council and Committees, etc., reference should be made to the Society's Memorandum and Articles of Association and Byelaws.

Divisions

For electoral purposes and where it is desired, area organization, the Society is now composed of the following geographical Divisions: (1) Scotland, (2) Northern Ireland, (3) North West, (4) North East, (5) Yorkshire, (6) West Midlands, (7) East Midlands, (8) South West, (9) South East, (10) South Wales and Monmouthshire. (See Byelaws for the Counties in each Division).

Membership

The Society is wholly dependent on the contributions of its members for the growth and the maintenance of its work, and invites the support of all who sympathize with and wish to promote its objects. These are stated in full in the Memorandum of Association, but they may be briefly summarized as the securing throughout the United Kingdom of the maximum of natural light and air free from every form of pollution, particularly that arising from the combustion of fuel. There are three main classes of membership—for individuals, local authorities, and corporate bodies such as firms, public undertakings and institutions. Individual members and the representatives of other members have rights of nomination and voting in elections for Officers and Council. They receive, free of charge, the Society's quarterly journal *Smokeless Air* and other publications. Local authority and corporate full members are also entitled to receive one *extra* copy of *Smokeless Air* and the Society's Year Book for each guinea by which their subscription exceeds three guineas. Corporate members who have branches or offices in Divisions of the Society other than that in which their Registered Office is situated may appoint Delegates to participate in the activities of those Divisions. Members are entitled to receive assistance and information on problems relating to air pollution. In addition to receiving notices of meetings and conferences organized nationally, they are entitled to participate in any activities organized by or within their Division.

Associates

Any individual, local authority, institution or corporate body contributing less than the appropriate membership subscription may become an *Associate*, entitled to some of the privileges of membership, but not to those relating to nomination, voting and election to office.

Subscriptions

Individual Members—Not less than £1 1s. 0d. a year.

Local Authority Members—Not less than the following amounts, according to populations:

Less than 25,000	..	6 guineas
25,000 to 50,000	..	8 ,,
50,001 to 75,000	..	10 ,,
75,001 to 100,000	..	15 ,,
100,001 to 250,000	..	25 ,,
250,001 to 500,000	..	36 ,,
Over 500,000	..	48 ,,

Corporate Members (which includes Companies, Firms, and Departments of Local Authorities)—Not less than 25 guineas for members appointing two Representatives; not less than 15 guineas for members appointing one Representative.

(Under Article 5 (e) (ii) of the Society's Articles of Association, an Association or firm which is not incorporated can appoint representatives to act on its behalf, and obtain all the benefits of Corporate Membership.)

Sustaining Members—A Member in any class subscribing not less than £100 a year. (See list page 74.)

Special Cases—The Executive Council may consider applications for membership on special terms as to subscriptions and otherwise. This rule is intended to apply in particular to local and other small voluntary associations wishing to become Corporate Members.

Associates—Any sum that is less than the appropriate subscription for membership.

Donations—The Society will be pleased to receive single or annual donations for any amounts from non-members.

Publications — Annual subscriptions may be made for *Smokeless Air* and for other publications as issued.

Payment of Subscriptions—The first subscription should be forwarded with application for membership. This may be sent at any time, and the subscription remains in force until the first day of the corresponding month of the following year. It is mutually advantageous if subscriptions are made by Banker's Order.

Covenant Donations—Annual contributions to the Society may be made under covenant, the Society being recognized as a "charity" by the Commissioners of Inland Revenue for this purpose. By signing an agreement to subscribe a stated sum for a period of at least seven years the Society may claim the amount of income tax that has been paid on such contributions, thereby increasing the benefit it receives without additional cost to the donor. Further particulars and form of covenant will be forwarded on request.

Representatives and Delegates

Local authority and Corporate Members are entitled to appoint Representatives to exercise on their behalf the rights of membership with regard to nomination for office, voting, receipt of publications, etc. Corporate Members may appoint one or two representatives each, according to subscription, and Local Authority Members a number according to population, as follows:

Less than 100,000	..	..	2
100,001 to 250,000	..	..	3
250,001 to 500,000	..	..	4
500,001 and over	..	..	5

Note: The Delegates mentioned previously participate in the activities of the Society *only* at Divisional level. A member's Representative exercises all the rights to which a member is entitled.

The names and addresses of Representatives should be forwarded on making application for membership, so that they may be entered in the Voting Registers.

Services to Members

Information and Advice

Advice, assistance and information on matters relating to atmospheric pollution and its prevention is available free of charge to Members, provided that, where necessary, the request is approved by the Executive Council. If the information required is not immediately available to the Society's Information Department, the Society is prepared, on behalf of a Member, to obtain it from one of the specialized Information Bureaux.

Library

The Society's Library is available for the use of all Members. It possesses classified files of Press cuttings, and an extensive collection of both British and foreign books, reports and pamphlets on air pollution and related subjects. In some cases, the Society is the only organization in the United Kingdom receiving the publication. Books and other publications are issued on loan, or may be consulted in the Society's offices. The Society is linked with various specialist and technical libraries, and when a publication relating to some special aspect of air pollution is not in the library, the Society can often borrow it through other sources. Applications should be made initially to the Librarian.

Lectures

The Society will be pleased to help members and others in any part of the country to arrange lectures and talks of all kinds on atmospheric pollution and related subjects. A panel of speakers, arranged regionally, is being prepared and will be supplied on request.

Slides

A library of 35 mm. transparencies covering all aspects of air pollution is in course of preparation. The slides will be available on loan. Details on request.

Films

The Society does not possess films or film strips for loan, but a comprehensive list of films available from other sources is given elsewhere in this Year Book.

Exhibitions

The Society is ready to consider participating in exhibitions, and has a supply of display material and portable exhibition units for loan.

Demand for this material is heavy particularly in spring and autumn, and it is essential that inquiries should be made as early as possible in advance.

No charge is made for the loan of the material other than the cost of carriage.

Publicity Advisory Service

The Society's Publicity Advisory Service is available to help Local Authorities and Corporate Members with their Clean Air Publicity, especially when Smoke Control Orders are pending.

The Service advises members on display material, its arrangement for exhibitions, stands, etc., and supplies information on other publicity activities such as public meetings, local press features and correspondence, educational work in schools, women's organizations, etc.

No charge is made for this service to members.

Exhibition Display Material

The Society has an exhibition display unit available for loan by local authorities and corporate members. Known as the "Speedframe Display", it consists of metal tubes which can be built up into a number of different shaped free-standing displays, to which are attached 30 ins. x 24 ins. display panels. The display comprises of eight panels as follows:

Clean Air and Health
Clean Air and the Home
Clean Air and the Cost of Living
Clean Air and Industry
Clean Air and the Vehicle
Clean Air and the Future
and two plain coloured panels

The complete display measures 10 ft. x 2 ft. x 7 ft. and incorporates a 2 ft. x 2 ft. table for literature. It requires ten travelling cases to transport and will be sent by rail or road service vehicles.

In addition the following framed information panels under perspex are available:

I.P. 1—I.P. 4, Death in a London Fog, Why have soot with your custard? (Attack on Plant Life, and Holiday Resort), the following new framed panels under perspex are now available: (Size 30ins. x 20ins. except where stated.)

I.P.6 *Smoke Damages Stonework*—Illustrations of St. Paul's Cathedral before and after cleaning.

I.P.7 *Smoke Harms the Countryside*—Illustrations of the effect of pollution on vegetation.

I.P.8 *Smoke is Injurious to Health.*—Illustrations of clean and dirty lungs.

I.P.9 *Pollution from Road Vehicles*—Illustrations of the menace created by both petrol- and diesel-engined vehicles.

I.P.10 *Pollution from Industry*—Contrasting pictures of smoke-producing factory chimneys and a model, no-smoke industrial plant.

I.P.11 *The Problem of Sulphur Dioxide*—Photographs show the effect of SO_2 on iron railings and on leather-bound books (illustrated above).

I.P.12 *Smokeless Zones Mean Cleaner Air*—Contrasting pictures of a city in a Black area with a new housing estate in a smoke-controlled area (illustrated above).

Posters

The Society has a number of coloured and line posters available, ranging in price from 1s. 9d. per copy (double crown) to £7 10s. per 100 copies (with a reduction for Members). Crown line posters cost 8d. per copy to £2 8s. for 100 copies.

The full list of posters available is as follows:

1. *Clean Air is Your Affair*
2. *It's Better Up Here . . .*
3. *Prevent Air Pollution—Britain's Biggest Headache*
4. *Smokeless Zones—Cleaner Homes*
5. *Away with Smoke—Let in the Light*
6. *These are the Things that Smoke Does.*

7/8. *For Clean Air*—Posters designed for local overprinting (Double Crown and Crown sizes available).

Literature

Inquiries are invited on the supply of publications, give-away leaflets, etc., for special purposes. Particulars of these are given below and also in the Society's "Guide to Publications", on another page.

(1) "Descriptive Summary of the Clean Air Act." 6d. per single copy (by post 8d.) 4s. 6d. per dozen, or £1 10s. per 100.

(2) "Clean Air Begins at Home". 15s. per 100, or £6 per 1,000.

(3) "Smoke Affects Your Health & Your Wealth." 15s. per 100, or £6 per 1,000.

(4) Clean Air Bookmarks—4s. per 100, 30s. per 1,000.

(5) Clean Air: Notes for Teachers and Lecturers. 1s. 6d. (1·10) per copy 15s. 6d. per dozen.

(6) Fumifugium 2s. 6d. (3s.).

(7) Sulphur Dioxide 2s. (2s. 6d.).

(8) Air Pollution from Road Vehicles 3s. (3s. 6d.).

Photographs

The Society has a classified and indexed collection of smoke and other photographs, which are suitable for reproduction and/or exhibition purposes.

New photographs of high pictorial quality, in colour and covering a wide range of air pollution control subjects have now been acquired by the Society. Prints may be inspected at the Society's offices, or a selection will be sent by post if details of requirements are given. The copyright in the photographs is retained by the photographer, and where reproduction fees are chargeable, the inquirer should communicate with the photographer.

Wall Chart

For school use. 44 ins. x 25 ins. (2s. including Lecture Notes.) From Educational Productions Ltd., 17 Denbigh Street, London, S.W.1.

Summary of Divisional Accounts

For the year ended 31 December, 1966

Division	*Commencing balance*			*Grants*			*Other Income*			*Expenditure*			*Closing balance*		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Scotland	189	13	7	100	0	0	279	11	1(*a*)	378	18	11(*a*)	190	5	9
Northern Ireland	80	7	9	—			99	7	0(*b*)	118	4	0(*b*)	61	10	9
North West	2	16	4	175	0	0	14	2	0	161	16	3	24	9	5
North East	*Debit* 61	3	4	—			1	3	9	60	19	5	1	7	8
Yorkshire	43	6	10	60	0	0	—			43	12	9	59	14	1
West Midlands	105	19	3	65	0	0		3	0	47	7	11	123	14	4
East Midlands	6	12	3	75	0	0	—			57	4	8	24	7	7
South West	2	17	6	20	0	0	—			—			22	17	6
South East	*Debit* 2	18	5	120	0	0	3	11	6	112	7	6	8	5	7
South Wales & Mon.	*Debit* 90	19	10	—			15	15	0	35	5	6	71	9	4
Totals	569	10	7	615	0	0	413	13	4	715	16	11	588	2	0

Notes: (*a*) includes fees and expenses for Annual Conference and Firemen's Classes.

(*b*) includes fees and expenses for Meeting.

NATIONAL SOCIETY FOR CLEAN AIR

(Limited by Guarantee—Incorporated 1 January, 1958)

Balance Sheet as at 31 December, 1966

1965 *£*		£	£
	GENERAL FUND		
16,680	Balance at 1 January, 1966	20,118	
3,438	*Add:* Surplus for the year	—	
20,118		20,118	
—	*Less:* Excess of Expenditure over Income for the year	31	
20,118			20,087
	PREMISES RESERVE FUND		
3,667	Balance at 1 January, 1966	4,667	
1,000	*Add:* Transfer from Income and Expenditure Account	—	
4,667			4,667
	JOHN STANLEY SEVERS LEGACY FUND		
5,187	Balance at 1 January, 1966	3,187	
2,000	*Less:* Transfer to Information and Publicity Services Account	1,000	
3,187			2,187
27,972			26,947
	CURRENT LIABILITIES		
1,642	Sundry Creditors and Accrued Expenses	1,978	
—	Bank Overdraft	400	
			2,378
£29,614			£29,319

1965 *£*		£	£
	FIXED ASSETS		
—	Office Equipment and Furniture		Not Valued
	INVESTMENTS, AT COST		
5,074	Government and Corporation Stocks	2,804	
3,945	Other Fixed Interest Stocks	4,120	
4,743	Ordinary Shares	14,248	
13,762			21,172
	(Market Value, 31.12.65 £13,572) (Market Value, 31.12.66 £19,090)		
	CURRENT ASSETS		
729	Stock of Posters, Charts, etc. at Valuation	427	
2,270	Sundry Debtors and Prepayments	3,212	
	Bank Balances:		
12,288	Deposit Account	4,454	
500	Current Account	—	
65	Cash in Hand	54	
15,852			8,147
£29,614			£29,319

JAMES GOODFELLOW, *Chairman*
ARNOLD MARSH, *Director and Secretary*

Income and Expenditure Account for the year ended 31 December, 1966

1965 £	EXPENDITURE	£	£
10,306	Salaries and Wages		11,094
1,469	Staff Pension Scheme		2,455
2,052	Rent, Rates, Light and Heat		1,960
2,315	Travelling, Insurance, Cleaning and General Expenses		2,017
232	Office Equipment and Furniture		76
474	Stationery and Supplies		522
	Smokeless Air and *Year Book:*		
3,651	Printing, Postage, etc.	3,514	
3,308	*Less:* Receipts from Advertisements	2,812	
343			702
2,869	Information and Publicity Services and Cost of Publications	1,804	
2,000	*Less:* Amount paid from John Stanley Severs Legacy	1,000	
869			805
585	Divisional Grants		615
—	Loss on Sale of Investments (Net)		102
18,645			20,348
	EXCESS OF INCOME OVER EXPENDITURE		
1,000	Transfer to Premises Fund	—	
3,438	Balance to General Fund	—	
4,438			—
£23,083			£20,348

1965 £	INCOME	£	£
14,595	Subscriptions and Donations		14,009
4,139	Conference Fees (London, October 1966)	12,245	
2,904	*Less:* Expenses	12,190	
1,235			55
8,448	Exhibition Income (London, October 1966)	9,545	
3,544	*Less:* Expenses	6,428	
4,904			3,117
1,042	Sales of Publications		1,322
	INVESTMENT INCOME		
522	Taxed Dividends (Net)	858	
244	Income Tax Repayment	448	
541	Bank Deposit Interest	457	
1,307			1,764
—	Premium on Conversion of 4½% Defence Bonds		50
			20,317
	EXCESS OF EXPENDITURE OVER INCOME		
—	Transferred to General Fund		31
£23,083			£20,348

REPORT OF THE HONORARY AUDITORS TO THE MEMBERS OF THE NATIONAL SOCIETY FOR CLEAN AIR

We have obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of our Audit. In our opinion proper books of account have been kept by the Society so far as appears from our examination of those books. We have examined the Balance Sheet and annexed Income and Expenditure Account which are in agreement with the books of account. In our opinion and to the best of our information and according to the explanations given us the said accounts give the information required by the Companies Act, 1948, in the manner so required and the Balance Sheet gives a true and fair view of the state of the Society's affairs as at 31 December, 1966, and the Income and Expenditure Account gives a true and fair view of the deficit for the year ended on that date.

GEO. LITTLE, SEBIRE & CO., *Chartered Accountants.*
Adelaide House, London Bridge, London, E.C.4. *Hon. Auditors.*

6 March, 1967

Subscriptions and Donations

1st January to 31st December, 1966

* Denotes Covenant Donor

(2) denotes two Subscriptions received during the year

Scottish Division

	£	s.	d.
Aberdeen Corporation	26	5	0
Airdrie Corporation	8	8	0
Ardrossan Corporation	6	6	0
Ayr County Council	5	0	0
Ayr Corporation (2)	6	6	0
*Barclay-Smith, Lt. Col. E. A.	1	1	0
Barrhead Corporation	6	6	0
Broadbent, J.	2	0	0
Clackmannan County Council	8	8	0
Clydebank Corporation	10	10	0
Coatbridge Corporation	10	10	0
Cooper, F. T.	1	1	0
Currie, T. S.	1	1	0
Dumbarton Corporation	6	6	0
Dumfries Corporation	8	8	0
Dunbarton County Council	26	5	0
Dundee Corporation	26	5	0
Dunfermline Corporation	8	8	0
East Kilbride Development Corpn.	7	7	0
East Kilbride Corporation	8	8	0
Edinburgh Corporation	37	16	0
Falkirk Corporation	8	8	0
Fife County Council	26	5	0
Francis, S. H.	1	1	0
Gibb, Dr. W.	1	1	0
Glasgow Corporation	50	8	0
Glasgow Tree Lovers' Society	1	1	0
Grangemouth Corporation	6	6	0
Grattidge, H. H.	1	1	0
Hamilton Corporation	4	4	0
Hawick Corporation	6	6	0
Howden, James & Co. Ltd.	26	5	0
Hughes, H. S.	1	1	0
Inverness County Council	10	10	0
Inverness Corporation	8	8	0
Irvine Corporation	6	6	0
Johnstone Corporation	6	6	0
Kilmarnock Corporation	8	8	0
Kilsyth Corporation	6	6	0
Kirkcaldy Corporation	10	10	0
Lanark County Council	37	16	0
Laurie, G.		5	0
Motherwell & Wishaw Corporation	10	10	0
North of Scotland Hydro-Electric Board	15	15	0
Page, J.	1	1	0
Paisley Corporation	15	15	0
Park, W. Y.	1	1	0
Perth County Council	3	3	0
Perth Corporation	8	8	0
Port Glasgow Corporation	2	2	0
Renfrew County Council	12	12	0
Renfrew Corporation	6	6	0
*Renwick, Dr. and Mrs. J.	1	0	0
*Ritchie, G. B.	1	1	0
Rothesay Corporation	6	6	0
Royal Sanitary Asscn. of Scotland	15	15	0
Rutherglen Corporation	6	6	0
Scottish Gas Board	73	10	0
Scott Park, Dr. and Mrs. S. D.	1	1	0
Shankland, Mrs. R.		15	0
Slimming, D. W.	1	5	0
Smith & Wellstood Ltd.	1	1	0
South of Scotland Elec. Board	50	0	0
Stirling County Council	26	5	0
Stirling Corporation	8	8	0
Strump, G.		10	6
Tucker, P.	1	1	0
Waldie & Cameron Ltd.	1	1	0
West Lothian County Council	8	8	0
Wightman, Mrs. U. N.	1	1	0

Northern Ireland Division

Antrim County Council	5	5	0
Ballymena Corporation	6	6	0
Belfast Corporation	37	16	0
Carey, Dr. G. C. R.	1	1	0
Carrickfergus Corporation	6	6	0
Castlereagh R.D.C. (2)	16	16	0
Coal Advisory Service	15	15	0
Davidson & Co. Ltd.	15	15	0
Edwards, Dr. M. D.	1	1	0
Edwards, T. G.	1	1	0
Electricity Board for Northern Ireland	15	15	0
*Ellison, C. A.	1	10	0
Guinness, Arthur Son & Co. (Belfast) Ltd.	15	15	0
Heywood, T. H.	1	1	0
Hood, N. R. S. (2)	2	2	0
Jenkins, Major W.	1	1	0
Londonderry Corporation	10	10	0
Lynas, K. H.	1	10	0
Magee, J. L.	1	1	0
McAlery, Cllr. Miss I. M. E.	1	1	0
McCutcheon, N.	1	1	0
Millar, J.	1	1	0
Muske, W. J.	1	1	0
O'Brien, W. E. C.	1	5	0
Ormeau Bakery Ltd.	15	15	0
Peel, R.	1	1	0
Pemberton, Professor J.	1	1	0
Porter, Colonel H. J.	2	2	0
Reynolds, A.	1	10	0

North West Division

Abram U.D.C.	6	6	0
Accrington Corporation	8	8	0
Affleck & Brown Ltd.	2	2	0
Altrincham Corporation	8	8	0
Amende, H. F.	1	0	0
Anonymous	20	0	0
Ashton Bros. & Co. Ltd.	2	2	0
Ashton-in-Makerfield U.D.C.	6	6	0
Atherton U.D.C.	6	6	0
Audenshaw U.D.C.	6	6	0
Bacup Corporation	6	6	0
Barrow-in-Furness Corpn.	10	10	0
Bayes, Alderman Mrs. M.	3	3	0
*Beard, E.	2	17	0
Beattie, E. & F. Ltd.	1	1	0
Bebington Corporation	10	10	0
Behrens, A.		10	0
Bibby, H. P.	2	2	0
Bibby, J. & Sons Ltd.	15	15	0
Birkenhead Corporation	2	2	0
Blackburn Corporation	26	5	0
Blackpool Corporation	26	5	0
Bolton Corporation	26	5	0
Bootle Corporation	12	12	0
Bredbury & Romiley U.D.C.	6	6	0
British Insulated Callender's Cables Ltd.	15	15	0

	£	s.	d.
*Brown, P. S.	1	1	0
Burnley Corporation	15	15	0
Bury Corporation	10	10	0
Buxton Corporation	6	6	0
Cass, H. V. (2)	2	0	0
Chadderton U.D.C.	8	8	0
*Chantler, P.	4	4	0
Cheadle & Gatley U.D.C.	8	8	0
Cheshire County Council	50	8	0
Chester R.D.C.	8	8	0
Chorley Corporation	8	8	0
Christian, F. V. (2)	2	2	0
Church U.D.C.	6	6	0
Clarke, Mrs. M.	1	1	0
Clitheroe Corporation	3	3	0
Clusky, H.	1	1	0
Coal Merchants' Federation of Great Britain	26	5	0
Colne Corporation	6	6	0
Community Council of Lancashire	2	2	0
Connah's Quay U.D.C.	6	6	0
Cooper, Miss I.	1	1	0
Cotton, Cllr. S. A.	1	1	0
Crewe Corporation	10	10	0
Crompton U.D.C.	6	6	0
Crosby Corporation	3	3	0
Cumberland County Council (2)	10	0	0
Darwen Corporation	8	8	0
Denton U.D.C.	8	8	0
Diamond, Miss P.	1	1	0
Droylsden U.D.C.	8	8	0
Duguid, S.	3	3	0
Duguid, Mrs. S. N.	1	1	0
Dukinfield Corporation	6	6	0
Eccles Corporation	8	8	0
Ellesmere Port Corporation	8	8	0
Failsworth U.D.C.	6	6	0
Fallows, W. B.	1	1	0
Farnworth Corporation	8	8	0
Ferranti Ltd.	21	0	0
Fleetwood Corporation	8	8	0
Flint Corporation	6	6	0
Franklin, E. J.	1	1	0
Franklin, N. J.	1	1	0
Fulwood U.D.C.	6	6	0
Furness District Federation of Owner-Occupiers' Asscns.	2	2	0
Gee, J.	1	1	0
Gibbons, E. B.	10	0	0
Glossop Corporation	6	6	0
Golborne U.D.C.	6	6	0
Graham, Mrs. E. M.	1	1	0
Great Harwood U.D.C.	6	6	0
Hale U.D.C.	6	6	0
Hall, A.	1	10	0
Hall, E. N.	1	1	0
Halliday, A. C.	1	10	0
Hallows, V. K.	1	1	0
Haslingden Corporation	6	6	0
Haydock U.D.C.	6	6	0
*Hayhurst, H.	1	1	0
Hazel Grove & Bramhall U.D.C.	6	6	0
*Heald, Dr. G. E.	1	1	0
Hendy, Dr. B.	1	1	0
Hetherington, H.	1	1	0
Heywood Corporation	8	8	0
Hindley U.D.C.	6	6	0
Horwich U.D.C.	6	6	0
Howe, A. J.	1	1	0
Hoylake U.D.C.	5	5	0
Huyton-with-Roby U.D.C.	10	10	0
Hyde Corporation	8	8	0
Ince-in-Makerfield U.D.C.	6	6	0
Irlam U.D.C.	6	6	0
Jackson, C. L.	1	1	0
Jewsbury, S.	1	1	0
Kearsley U.D.C.	6	6	0
*Keddie, Dr. J T Chalmers	1	1	0
Kerr, J.	3	3	0
Kirk, W. R.	1	1	0
Kirkby U.D.C.	10	10	0
Kitchener, The Rt. Hon. The Earl	1	0	0

	£	s.	d.
Lancashire County Council	52	10	0
Lancashire & District Coke Distributors' Asscn.	26	5	0
Lancaster Corporation	8	8	0
Lane, Mrs. W.	1	1	0
Langford, A. S.		10	6
Lees U.D.C. (2)	12	12	0
Lees, Miss M.	1	1	0
Leigh Corporation	8	8	0
Leyland U.D.C.	6	6	0
Littleborough U.D.C.	6	6	0
Liverpool Corporation	50	8	0
Longdendale U.D.C.	6	6	0
MacWilliam, Dr. H. H.		15	0
Macclesfield Corporation	8	8	0
*Macnair, A. S.	1	1	0
Manchester Corporation	50	8	0
Manchester & District Regional Clean Air Council	15	15	0
Marple U.D.C.	6	6	0
Martindale, R. L.	1	1	0
*Mather, W. L.	1	0	0
Mather & Platt Ltd.	50	0	0
Matlock U.D.C.	6	6	0
Mercer & Sons Ltd.	1	1	0
Merseyside & North Wales Elec. Board	51	0	0
Middleton Corporation	10	10	0
Middlewich U.D.C.	6	6	0
Mitchell, L. A.	1	1	0
Mold U.D.C.	6	6	0
Morecambe & Heysham Corpn.	8	8	0
Nantwich U.D.C.	6	6	0
National Federation of Owner-Occupiers' & Owner-Residents' Associations	3	3	0
Nelson Corporation	8	8	0
Newton-le-Willows U.D.C.	6	6	0
North Western Elec. Board	76	0	0
Northwich R.D.C.	8	8	0
Northwich U.D.C.	6	6	0
*Norwood, Mrs. D. B.	1	1	0
Oldham Corporation	26	5	0
Ormskirk U.D.C.	6	6	0
Padiham U.D.C.	6	6	0
Pennington, H.	1	1	0
Pike, Miss I. M.	1	1	0
Polding, W. W.		10	6
Preston Corporation	26	5	0
Preston R.D.C.	8	8	0
Prestwich Corporation	8	8	0
Radcliffe Corporation	8	8	0
Rae, Cllr. K. F.	1	1	0
Ramsbottom U.D.C.	6	6	0
Rawtenstall Corporation	8	8	0
Refuge Assurance Co. Ltd.	12	12	0
Rhyl U.D.C.	6	6	0
Richards, J. E. (2)	2	2	0
Rishton U.D.C.	2	2	0
Rochdale Corporation	15	15	0
Roper, J. F. H.	1	1	0
Royton U.D.C.	6	6	0
Runcorn R.D.C. (2)	16	16	0
Runcorn U.D.C.	8	8	0
St. Helens Corporation (2)	52	10	0
Sale Corporation	8	8	0
Salford Corporation	26	5	0
Scott, Mrs. A. O.	1	0	0
Shaw, Mrs. M.	1	1	0
Simon-Carves Ltd. (2)	200	0	0
Skelmersdale U.D.C.	6	6	0
South-East Lancs. & North Cheshire Consultative Committee for the Investigation of Atmospheric Pollution	2	2	0
Southport Corporation	1	1	0
Stalybridge Corporation	6	6	0
Standish-with-Langtree U.D.C.	6	6	0
Stanyard, R. J.	1	1	0
Stockport Corporation	26	5	0
Stretford Corporation	10	10	0
Summers, John & Sons Ltd.	26	5	0

	£	s.	d.
Swinton & Pendlebury Corpn.	8	8	0
Taylor, Mrs. A. E.	1	1	0
Taylor, A.	1	1	0
Taylor, Mrs. E.	1	1	0
Taylor, S.	1	1	0
Taymar Ltd.	2	2	0
Thomas, F. L.	1	0	0
Thornton Cleveleys U.D.C.	5	5	0
Thorpe, J. A.	1	1	0
Tillotsons Newspapers Ltd.	15	15	0
Tintwistle R.D.C.	2	2	0
Topham, Mrs. D. A.	1	1	0
Tyldesley U.D.C.	6	6	0
Up Holland U.D.C.	6	6	0
Urmston U.D.C.	8	8	0
*Vanstone, H. B.	1	16	0
Viney, N. H.	1	1	0
Wallasey Corporation	26	5	0
Warrington Corporation (2)	31	10	0
Warrington Local Medical Cttee.	2	2	0
Warrington R.D.C.	2	2	0
West Lancashire R.D.C.	1	1	0
Whiston R.D.C.	8	8	0
Whitefield U.D.C.	6	6	0
Whitworth U.D.C.	6	6	0
Widnes Corporation	10	10	0
Wigan Corporation	15	15	0
*Williams, W. B.	1	0	0
Wilmslow U.D.C.	6	6	0
Winsford U.D.C.	8	8	0
Wood, Mrs. C.	1	1	0
Workington Corporation	8	8	0
Worsley U.D.C.	8	8	0
Wrexham Corporation	8	8	0
Wrexham R.D.C.	10	10	0

North East Division

	£	s.	d.
*Angus, Colonel E. G.	3	3	0
Ashington U.D.C.	8	8	0
*Atkinson, E.		15	0
Atkinson, H.		15	0
Barnard Castle R.D.C.	6	6	0
Bedlingtonshire U.D.C.	8	8	0
Billingham U.D.C.	6	6	0
Bird, D.	1	1	0
Bishop Auckland U.D.C.	8	8	0
Blaydon U.D.C.	8	8	0
Bradley, R. M.	1	1	0
Brandon & Byshottles U.D.C.	6	6	0
Bulcock, The Reverend K.	2	2	0
*Calvert, Mrs. M. R.	1	10	0
Carr, W.	1	1	0
Castle Ward R.D.C.	6	6	0
Chester-le-Street R.D.C.	8	8	0
Chester-le-Street U.D.C.	6	6	0
Consett U.D.C.	8	8	0
Crook & Willington U.D.C.	8	8	0
Darlington Corporation	7	7	0
Dorman, Long & Co. Ltd.	15	15	0
Durham R.D.C.	8	8	0
Eston U.D.C.	8	8	0
Felling U.D.C.	8	8	0
Gateshead Corporation	26	5	0
Gosforth U.D.C. (2)	12	12	0
Hartlepool Corporation	6	6	0
Head Wrightson & Co. Ltd.	15	15	0
Head Wrightson Iron & Steel Works Eng. Ltd.	26	5	0
Hebburn U.D.C.	6	6	0
Hibbs, N. T. B.	1	1	0
Houghton-le-Spring U.D.C.	8	8	0
Imperial Chemical Industries Ltd. (Agricultural Divn.)	15	15	0
*Isaac, Professor P. C. G.	1	1	0
Jarrow Corporation	8	8	0
Lanchester R.D.C.	6	6	0
Middlesbrough Corporation	26	5	0
Newburn U.D.C.	8	8	0
Newcastle-upon-Tyne Corpn.	37	16	0
North Eastern Elec. Board	42	0	0
Northern Coke Distributors' Asscn.	15	15	0
Northumberland County Council	37	16	0
*Ogilvie, Dr. A. G.	1	1	0
Orchard, G. W.	1	1	0
Prudhoe U.D.C.	6	6	0
Atkinson, C. A. P.	1	1	0
Redcar Corporation	8	8	0
Ryton U.D.C.	6	6	0
Saltburn & Marske-by-the-Sea U.D.C.	6	6	0
Seaham U.D.C.	8	8	0
Sedgefield R.D.C.	8	8	0
Shildon U.D.C.	6	6	0
Skelton & Brotton U.D.C.	6	6	0
Smith, R. D.	1	1	0
Spennymoor U.D.C.	6	6	0
*Spriggs, Dr. E. A.	1	1	0
Stanley (Co. Durham) U.D.C.	8	8	0
Stockton-on-Tees Corpn.	5	5	0
Sunderland Corporation (2)	52	10	0
Sunderland R.D.C.	8	8	0
Tate, G. W.	1	1	0
Thornaby-on-Tees Corpn.	6	6	0
Tynemouth Corporation	10	10	0
University of Newcastle/Tyne	3	3	0
Wallsend Corporation	8	8	0
Washington U.D.C.	6	6	0
West Hartlepool Corpn.	15	15	0
Whickham U.D.C.	6	6	0
Whitley Bay Corporation	8	8	0

Yorkshire Division

	£	s.	d.
Adwick-le-Street U.D.C.	6	6	0
Aireborough U.D.C.	8	8	0
Allingham, J. C.	1	1	0
Armitage, F.	1	1	0
Barnsley District Coking Co. Ltd.	15	15	0
Batley Corporation	8	8	0
Bentley-with-Arksey U.D.C.	6	6	0
Bingley U.D.C.	6	6	0
Boyd, Miss A. D.	1	1	0
Bradford Corporation	37	16	0
Bridlington Corporation	8	8	0
Brighouse Corporation	8	8	0
Brown, G. L.	2	2	0
Burn, Dr. A. Telford	1	1	0
Castleford Corporation	8	8	0
Clayton, Son & Co. Ltd.	2	2	0
Colne Valley U.D.C.	6	6	0
Conisbrough U.D.C.	6	6	0
Cudworth U.D.C.	6	6	0
Darton U.D.C.	6	6	0
Dearne U.D.C.	6	6	0
Denby Dale U.D.C.	6	6	0
Dewsbury Corporation	10	10	0
Doncaster Corporation	15	15	0
Doncaster R.D.C.	10	10	0
Elland U.D.C.	6	6	0
Etherington, H.	1	1	0
Fleming, I.	1	1	0
Gifford, Dr. P. W. W.	1	1	0
Goodfellow, J.	1	1	0
Hackney, E. S.	1	1	0
Halifax Corporation	15	15	0
Harrogate Corporation	10	10	0
Heckmondwike U.D.C.	6	6	0
Hemsworth R.D.C.	10	10	0
Hemsworth U.D.C.	6	6	0
Henderson, W.	1	1	0
Hepton R.D.C.	6	6	0
Holmes, W. C. & Co. Ltd.	26	5	0
Holmfirth U.D.C.	6	6	0
Horsforth U.D.C.	6	6	0
Hoyland Nether U.D.C.	6	6	0
Huddersfield Corporation	26	5	0
Hunslet (Holdings) Ltd.	15	15	0
*Hutton, Dr. K. B.	10	0	0
Jenkins, The Reverend P. W.	1	1	0
Jervis, Dr. J. Johnstone	1	1	0
Jones, L.	1	1	0
Jordan, H. H.	1	1	0
Keighley Corporation	2	2	0
Kingston-upon-Hull Corpn.	37	16	0

	£	s.	d.
Knottingley U.D.C.	6	6	0
Law, J.	1	1	0
Leeds Corporation	50	8	0
Lewis, P. D.	1	1	0
Machen, C.	1	1	0
*Marshall, G. C.	1	5	0
McLintock, Dr. S. W.	1	1	0
Mexborough U.D.C. (2)	12	12	0
Middlebrook, C. J.	1	1	0
Mirfield U.D.C.	6	6	0
Moore, L.		15	0
North Eastern Coke Distributors' Association	15	15	0
North Eastern Gas Board	42	0	0
North Riding of Yorkshire County Council	37	16	0
Nu-Swift International Ltd.	50	0	0
Ossett Corporation	6	6	0
Otley U.D.C.	6	6	0
Park Gate Iron & Steel Co. Ltd.	26	5	0
Pontefract Corporation	8	8	0
Pudsey Corporation	8	8	0
Queensbury & Shelf U.D.C.	6	6	0
Rawmarsh U.D.C.	6	6	0
Rotherham Corporation	15	15	0
Rothwell U.D.C. (2)	16	16	0
Royston U.D.C.	6	6	0
Scarborough Corporation	2	2	0
Scargill, M.	1	1	0
Sharp, A. I.	1	1	0
Shaw, D.	1	1	0
Sheffield & District Clean Air Committee	50	8	0
Shipley U.D.C.	8	8	0
Skinningrove Iron Co. Ltd.	10	0	0
Skipton U.D.C.	6	6	0
Slater, D. J.	1	1	0
Sowerby Bridge U.D.C.	6	6	0
Spenborough Corporation	8	8	0
Stanley (Yorks.) U.D.C.	6	6	0
Steam Storage Co. Ltd.	1	1	0
Swinton U.D.C.	6	6	0
Todmorden Corporation	6	6	0
Tuckley, Miss B. E.	1	1	0
*Underwood, Dr. G.	1	1	0
United Steel Companies Ltd.	50	0	0
Universal Machinery & Services Ltd.	15	15	0
Wakefield Corporation	10	10	0
Wakefield R.D.C.	6	6	0
Wath-upon-Dearne U.D.C.	6	6	0
Wilson, H.	1	1	0
Wombwell U.D.C.	6	6	0
Wood, F. T.	1	1	0
Worsbrough U.D.C.	6	6	0
Wortley R.D.C.	8	8	0
York Corporation	5	5	0
Yorkshire Electricity Board	82	0	0

West Midlands Division

	£	s.	d.
Aldridge-Brownhills U.D.C.	15	15	0
Barnes, A. J.	1	1	0
Bedworth U.D.C.	8	8	0
Birmingham Corporation	50	8	0
Brooke, J. R.	1	1	0
Burton-upon-Trent Corporation	10	10	0
Cadbury Bros. Ltd.	15	15	0
Cannock R.D.C.	8	8	0
Cannock U.D.C.	8	8	0
Comley, A. & Wall Ltd.	1	1	0
Coventry Corporation (2)	15	12	0
Cradley Boiler Co. Ltd.	75	15	0
Danks, E. & Co. (Oldbury) Ltd.	26	5	0
Dickinson, S.	1	1	0
Dingley, Alderman W. L.	1	1	0
Donaldson, I. J.	1	1	0
Dudley Corporation	26	5	0
Fletcher, J. P.	1	5	0
Garner, N. A.	1	0	0
Gibbons Bros., Ltd.	25	0	0
Gillett, Mr. & Mrs. J. A.	2	2	0
Gimson, J. & Co., Ltd.	15	15	0
*Grimmett, P. H. G.	1	1	0
G.W.B. Furnaces Ltd.	15	15	0
Halesowen Corporation	8	8	0
Hereford Corporation	8	8	0
Hockton, D.	2	0	0
Kidderminster Corporation	8	8	0
Lichfield R.D.C.	8	8	0
Lowbridge, H. E. T.	1	1	0
Magness, Cllr. F. V.	1	1	0
Martine, Dr. W. R.	1	1	0
Meriden R.D.C.	10	10	0
Midland Counties Coke Distributors' Asscn.	15	15	0
Midlands Electricity Board	79	0	0
Midlands Joint Advisory Clean Air Council	10	10	0
Moore, J.	1	1	0
Moore, Dr. R. M. A.	1	1	0
Newcastle-under-Lyme Corpn.	15	15	0
Nuneaton Corporation	10	10	0
Owen, A. G.	1	1	0
Pate, A.	1	1	0
*Pringle, Dr. E.	1	1	0
Pringle, Dr. J. E.	1	1	0
Redditch U.D.C.	8	8	0
Reynolds, F.	1	1	0
*Reynolds, K.	3	0	0
Rugby Corporation	8	8	0
Rugeley U.D.C.	6	6	0
Seisdon R.D.C.	2	2	0
Smart, R. C.		10	6
Solihull Corporation	15	15	0
Stafford Corporation	8	8	0
Staffordshire County Council	30	5	0
Steadman, A. T.	1	1	0
Stoke-on-Trent Corporation	37	16	0
Stone R.D.C.	6	6	0
Sutton Coldfield Corpn.	10	10	0
Taylor, Mr. & Mrs. C. B.	2	2	0
Walsall Corporation	26	5	0
Waltho, R. B.	1	1	0
Ward, Mrs. M. G.	1	1	0
Warley Corporation	26	5	0
Warwick Corporation	6	6	0
Warwick R.D.C.	8	8	0
Warwickshire County Council	18	18	0
Wednesfield U.D.C. (part-year)	1	1	0
Wellington (Salop) U.D.C. (2)	1	1	0
West Bromwich Corporation	15	15	0
West Midlands Gas Board	105	0	0
Wolverhampton Corporation	37	16	0
Worcester Corporation	10	10	0

East Midlands Division

	£	s.	d.
Alfreton U.D.C.	6	6	0
Allison, G.	2	2	0
Ambrose, R. F.	2	0	0
Ballard, W. A.	1	1	0
Basford R.D.C.	10	10	0
Beeston & Stapleford U.D.C.	10	10	0
Belper U.D.C.	6	6	0
Blaby R.D.C.	8	8	0
Blackwell R.D.C.	8	8	0
Bolsover U.D.C.	6	6	0
Boston Corporation	6	6	0
*Brown, J. A.	1	1	0
Cambridge Corporation	1	1	0
Carlton U.D.C.	8	8	0
Carpenter, The Reverend V. A.		10	6
Chesterfield Corporation	10	10	0
Chesterfield R.D.C.	15	15	0
Clay Cross U.D.C.	6	6	0
Clowne R.D.C.	6	6	0
Coalite & Chemical Products Ltd.	400	0	0
Coalville U.D.C.	8	8	0
Cooper, Alderman S.	1	0	0
Corby U.D.C.	8	8	0
Crowther, Dr. J. S.	1	1	0
Davies, Dr. D.	1	1	0
Dearden, Mr. & Mrs. J.	3	0	0
Derby Corporation	26	5	0

	£	s.	d.
Dronfield U.D.C.	6	6	0
Eales, C. D.	1	1	0
Eastern Electricity Board	77	0	0
East Midlands Electricity Board	61	0	0
East Midlands Gas Board	73	10	0
Eastwood U.D.C.	6	6	0
Gainsborough U.D.C.	6	6	0
Glanford Brigg R.D.C. (2)	16	16	0
Grantham Corporation	8	8	0
Great Yarmouth Corporation	10	10	0
Grimsby Corporation	15	15	0
Gurney, J.	7	0	0
Harper, Dr. R. (2)	2	2	0
Heanor U.D.C.	6	6	0
Hiller, G. A.	1	1	0
*Hillier, Miss E. I.	1	1	0
Hinckley U.D.C.	8	8	0
Ilkeston Corporation	8	8	0
Ipswich Corporation	26	5	0
Irthlingborough U.D.C.	6	6	0
Jackson, J. B. (2)	2	2	0
Kettering Corporation	8	8	0
King's Lynn Corporation	8	8	0
Kirkby-in-Ashfield U.D.C.	6	6	0
Leicester Corporation	37	16	0
Long Eaton U.D.C.	8	8	0
Loughborough Corporation	8	8	0
Lowestoft Corporation	8	8	0
Low Temperature Coal Distillers Asscn.	15	15	0
Mansfield Corporation	10	10	0
Mansfield Woodhouse U.D.C.	6	6	0
McDonald, J. D.	1	1	0
Needham, C. E.	2	0	0
Newark Corporation	6	6	0
Norwich Corporation	26	5	0
Nottinghamshire County Council	10	10	0
Old Fletton U.D.C.	6	6	0
Pepperdine, Cllr. E. C.	1	1	0
Peterborough Corporation	10	10	0
*Pleister, Miss E. M. J.	1	1	0
Repton R.D.C.	2	2	0
Ripley U.D.C.	6	6	0
Rushden U.D.C.	6	6	0
Scopes, F. V.	1	1	0
Scunthorpe Corporation	10	10	0
Smith, Lt.-Col. C. H.	2	2	0
Southwell R.D.C.	8	8	0
Staveley U.D.C.	6	6	0
Stewarts & Lloyds Ltd.	50	0	0
Sutton-in-Ashfield U.D.C.	8	8	0
Swadlincote U.D.C.	6	6	0
Turner, Miss H. E.	2	0	0
*Turner, T. Henry	2	0	0
Wade, A.	1	1	0
Waring, F. L.	5	5	0
Weldon, Miss G. M.	2	2	0
Wellingborough U.D.C.	3	3	0
West Bridgford U.D.C.	8	8	0
Wilkinson, J. R.	1	10	0
Williams, E. V. H.	1	1	0
Wisbech Corporation	6	6	0
Woodcock, F. Huntly	1	1	0
Worksop Corporation	8	8	0
Worksop R.D.C.	6	6	0

South West Division

	£	s.	d.
Bartlam, J. N.	4	0	0
Bathavon R.D.C.		10	6
Bath Corporation	15	15	0
Best, J. K.	1	1	0
Blampied, F. C.	1	1	0
Bridgwater Corporation	1	1	0
Bristol Corporation	37	16	0
Cawley, Lady	3	0	0
Cheltenham Corporation	10	10	0
Chudley, J. C.	2	2	0
Colehan, J. E.	1	1	0
Collectron (Sales) Ltd.	15	15	0
Crook, S. C.	1	1	0
Draper, P.	1	1	0
Dursley R.D.C.	6	6	0
Gloucester Corporation	10	10	0
Greenwood, T. A. S.		15	0
Harris, J.	1	1	0
Imperial Tobacco Company (of G.B. & Ireland) Ltd.	26	5	0
Keynsham U.D.C.	1	1	0
Kingswood U.D.C.	8	8	0
Lydney R.D.C.	6	6	0
Mangotsfield U.D.C.	1	1	0
Norton-Radstock U.D.C.	1	1	0
Poole Corporation	2	2	0
Redston, R. V.	1	1	0
Shepton Mallet R.D.C.		10	6
Sherborne U.D.C.	1	0	0
Sodbury R.D.C.	4	4	0
South Western Electricity Board	33	0	0
South Western Gas Board	36	15	0
Stroud U.D.C.	6	6	0
Swindon Corporation	15	15	0
Symonds, A. A.	1	1	0
Tetbury R.D.C.		10	6
Tewkesbury Corporation	2	2	0
Thornbury R.D.C.	8	8	0
Trevillion, Mrs. F.	1	1	0
Wallis, Mrs. E.	1	1	0
Weston-super-Mare Corporation	2	2	0
West Penwith R.D.C.	6	6	0
Weymouth & Melcombe Regis Corporation	8	8	0
Wheatley, Dr. K. H.	1	11	6
Whiting, G. C.	2	0	0

South East Division

	£	s.	d.
Acworth, Miss E. A.	1	1	0
Acworth, Miss W. B.	5	5	0
Allied Ironfounders Ltd.	26	5	0
Ambuco Ltd.	15	15	0
Amersham R.D.C.	8	8	0
Armstrong, F. W.	1	0	0
Association of Public Health Inspectors	15	15	0
Atkinson, Mrs. M.	1	0	0
Ault, H.	1	1	0
Aylesbury Corporation	8	8	0
Bailey, H. D.	1	1	0
Baird, D. E.	1	1	0
Barash, Dr. M.	1	1	0
Barber, S. S.	1	1	0
Barking, London Borough of	26	5	0
Barnet, London Borough of	37	16	0
Basildon U.D.C.	26	5	0
Bastable, N.	1	1	0
Beaumont, M.	2	2	0
Bedford Corporation	10	10	0
Bedfordshire County Council	37	16	0
Bexley, London Borough of	26	5	0
Bishop's Stortford U.D.C.	6	6	0
Bligh, Mrs. M. F.	1	1	0
Bognor Regis U.D.C.	2	2	0
Bonnell, Dr. J. A.	1	1	0
Bottom, D. W.	1	1	0
Boult, Sir Adrian C.	1	1	0
*Boult, Miss O.	1	1	0
Bournemouth Corporation	2	2	0
*Boyd, Miss D.	1	1	0
Bradbury-Williams, J. C.	1	1	0
Bradford, S. G.	1	1	0
Braintree R.D.C.	6	6	0
Brent, London Borough of	37	16	0
Brighton Corporation	26	5	0
British Iron & Steel Federation	350	0	0
British Medical Association	26	5	0
British Petroleum Co., Ltd.	100	0	0
Bromley, London Borough of	37	16	0
Brooks, J. F.	1	1	0
*Brown, A. W.	1	1	0
*Bryant, Miss P. M.	1	1	0
Buckle, G. H. & Partners	26	5	0
Buist, Commander C.	10	10	0
Bullingdon R.D.C.	8	8	0

	£	s.	d.
Burke, Dr. S. A.	1	11	6
Bushey U.D.C.	6	6	0
Butler, J. W.	2	2	0
Caller, Dr. S.		10	6
Calor Gas Distributing Co. Ltd. ..	15	15	0
Camden, London Borough of ..	26	5	0
Capes, F. B.		15	0
Card, H. T.	1	1	0
Carter, Dr. J. S.	3	3	0
Catterall, Dr. Mary (2)	4	4	0
Cave, Miss R.	1	1	0
Central Electricity Generating Board	362	0	0
Charrington, Gardner, Locket & Co., Ltd.	15	15	0
Chatfield, A. J.	1	1	0
Chatham Corporation	8	8	0
Chesham U.D.C.	6	6	0
Cheshunt U.D.C.	8	8	0
Chigwell U.D.C.	15	15	0
*Chivers, D. P.		15	0
Clacton U.D.C.	3	3	0
Clarke, Dr. R. T. V.	1	10	0
*Clarke, S. H...	1	0	0
*Clinch, H. G.	1	1	0
Coal Utilisation Council (2) ..	52	10	0
College of Fuel Technology	15	15	0
Courtier, G. B.	1	5	0
Cousin, Lt. Col. A. J.	1	1	0
Crawley U.D.C.	8	8	0
Croydon, London Borough of ..	10	10	0
*Damon, W. A.	1	1	0
Dartford Corporation	8	8	0
Davies, P. M.	1	1	0
Davis, E. T. A.	1	1	0
Davis, Dr. J. B.	1	1	0
Dobson, P. F.	1	0	0
Dover Corporation	8	8	0
Dray, F.	1	1	0
Drummond Dust & Fume Extractors Ltd.	15	15	0
Dust Suppression Ltd.	15	15	0
Ealing, London Borough of	37	16	0
*East, R. G.	1	1	0
Eastbourne Corporation	10	10	0
Eastern Gas Board	42	0	0
Eastleigh Corporation (2)	16	16	0
Easy Heating Company	15	15	0
*Eaton, Dr. F. J.	3	10	0
Egham U.D.C.	8	8	0
Electrical Association for Women ..	26	5	0
Electricity Council	363	0	0
Elstree R.D.C.	6	6	0
*Elsworthy, J. G.	2	2	0
Enfield, London Borough of ..	37	16	0
Epping & Ongar R.D.C.	8	8	0
Epsom & Ewell Corporation ..	10	10	0
Esher U.D.C.	10	10	0
Essex County Council	3	3	0
Esso Petroleum Co., Ltd.	150	0	0
Eton R.D.C.	10	10	0
Farnborough U.D.C.	2	2	0
Federation of British Cremation Authorities	2	2	0
Fell, N. F.	1	1	0
Folkestone Corporation	8	8	0
Ford Motor Co., Ltd.	26	5	0
*Forrester, Dr. C.	2	2	0
Fox, Dr. R. H.	1	1	0
Franklin, C. Ltd.	2	2	0
*Gandy, H.	1	10	0
*Gandy, Miss R. L.	2	2	0
Gardiner, P. C.	1	1	0
Gas Council	350	0	0
Gillingham Corporation	10	10	0
*Gillison, Dr. J. A.	2	2	0
Goodeve, Sir C. F. (2)	4	4	0
Gilpin, A.	1	1	0
Gosport Corporation	1	1	0
Graves, T. G.	1	1	0
Gravesend Corporation	8	8	0
Greater London Council	100	0	0
*Green, J.	1	1	0

	£	s.	d.
Greenwich, London Borough of ..	26	5	0
Greenwood, Mrs. E. L.	1	1	0
Groove, Mrs. G. I.	1	1	0
Guildford Corporation	10	10	0
Guildford R.D.C.	10	10	0
Guinness, A. Son & Co. (Park Royal) Ltd.	26	5	0
Hackney, London Borough of ..	37	16	0
Hales, J. S.	2	2	0
Halsted, V.	1	1	0
Hammersmith, London Borough of	26	5	0
Harlow U.D.C.	8	8	0
Harris Engineering Co. Ltd... ..	26	5	0
Harrold Leather Mfg. Co., Ltd. ..	1	1	0
Harrow, London Borough of ..	26	5	0
Hastings Corporation	10	10	0
Havant & Waterloo U.D.C. ..	8	8	0
Havering, London Borough of ..	37	16	0
Held, P. E. J.	1	1	0
Hemel Hempstead Corporation ..	8	8	0
Hickman, Miss V. (2)	2	2	0
High Wycombe Corporation ..	8	8	0
Hillingdon, London Borough of ..	26	5	0
Hitchin U.D.C.	6	6	0
Hoddesdon U.D.C.	6	6	0
Holiday Fellowship Ltd.	2	2	0
Horsham U.D.C.	6	6	0
Hounslow, London Borough of ..	26	5	0
Hove Corporation	10	10	0
Hulme, G. H.	1	5	0
Hussey, R.	1	1	0
Imperial Chemical Industries Ltd.	100	0	0
Institute of Fuel	26	5	0
Institution of Gas Engineers ..	15	15	0
International Combustion (Holdings)			
International Nickel Ltd.	15	15	0
*James, B. W.	1	0	0
Jellis, F.	1	1	0
Jones, W. L.	1	1	0
Jessel, T. F. H.	3	3	0
Kenney, J. G.	1	1	0
Kensington & Chelsea Corporation..	3	3	0
Kent County Council	5	5	0
*Kershaw, C. A.	1	1	0
Kingston-upon-Thames Corporation	26	5	0
*Kitchin, C. Harcourt	2	2	0
Langwell, W. H.	1	0	0
Laundon, J. R.	1	1	0
Lax, Mrs. G.	1	1	0
Leagrave Press Ltd.	15	15	0
Leatherhead U.D.C.	2	2	0
*Lee, Sir Kenneth	1	0	0
*Lee, S. A.	1	5	0
Leveson Gower, Miss V.	1	0	0
Lewin, J. Upton	1	1	0
Lewisham, London Borough of ..	37	16	0
Lister, B. S.	2	0	0
Littlehampton U.D.C.	1	11	6
London (City) Corporation of ..	50	8	0
London Electricity Board	69	0	0
London & Home Counties Clean Air Advisory Council	15	15	0
London Trades Council	2	2	0
London Transport Board	26	5	0
Lord, D. G.	1	1	0
Luton Corporation	2	2	0
Maidenhead Corporation	8	8	0
Mann, A. C.	1	1	0
Mason, J. K.	1	1	0
Matthews, Dr. N. E.	1	1	0
Medawar, Lady	1	0	0
Melland, B.	1	10	0
Mellins, Mrs. M. H.	1	1	0
Menuhin, Yehudi	1	1	0
Merton, London Borough of.. ..	26	5	0
Metal Box Co., Ltd.	15	15	0
Mobil Oil Co., Ltd.	26	5	0
Monkhouse, Dr. A. C.	1	1	0
Moreland, S.	1	1	0
Municipal Passenger Transport Asscn. (Inc.)	15	15	0
National Carbonising Co., Ltd. ..	26	5	0

	£	s.	d.
National Coal Board	1,000	0	0
New Forest R.D.C.	10	10	0
Nightingale, M. J. H.	2	0	0
Nonhebel, Dr. G.	1	1	0
Northfleet U.D.C.	6	6	0
North Thames Gas Board	105	0	0
Oxford Corporation	26	5	0
Parker, Dr. A.	5	5	0
Parker, H.	1	1	0
Parkinson, A. C.	1	1	0
Parry, M.		15	0
Pavey, A. F.	1	5	0
Pedrick, F.	1	1	0
Pennington, W. J.	1	1	0
Petrofina (Gt. Britain) Ltd.	26	5	0
Platt, Mrs. K. M.	1	1	0
Ponting, Cllr. J. (2)	2	2	0
Poole, Mrs. W. M.	1	1	0
Portsmouth Corporation	10	10	0
Potter, Dr. N. M.	1	1	0
Preston, Dr. T. W.	1	1	0
Public Transport Association	21	0	0
Radiation Ltd.	31	10	0
Radiovisor Parent Ltd.	21	0	0
Reading Corporation	5	5	0
Redbridge, London Borough of	26	5	0
Reigate Corporation	1	1	0
Richards, J. P.	1	1	0
*Richardson, R. L.	4	0	0
Richmond upon Thames, London Borough of	26	5	0
Rickett Cockerell & Co., Ltd.	7	7	0
Rickmansworth U.D.C.	8	8	0
Robbins, Mr. and Mrs. R. H. A.	1	1	0
*Robinson, Mrs. E.	2	2	0
Rochester Corporation	8	8	0
Rogers, E. C.	1	1	0
Rogers, Miss J. Scott	1	0	0
Roper, J. D.	1	1	0
Roper, R.		10	6
Rosling, Miss E. M.	1	1	0
Royal Society of Health	15	15	0
Rundle, L. G.		15	0
Sansum, Mrs. E. B.	1	1	0
Scorer, Professor R. S.	1	1	0
Scotson, D. A.	1	1	0
Shackcloth, W.	1	1	0
Shanks, E. C.		15	0
Shaw Scott, G.	1	1	0
Shell International Petroleum Co., Ltd.	150	0	0
Shell-Mex & B.P. Ltd.	150	0	0
Sittingbourne & Milton U.D.C.	6	6	0
Slough Corporation	10	10	0
Smith, A. R.	2	2	0
Smith, Mrs. P.	1	1	0
Solid Smokeless Fuels Fedn.	52	10	0
Southampton Corporation	1	1	0
South Eastern Electricity Board	48	0	0
South Eastern Gas Board	105	0	0
Southend-on-Sea Corporation	2	2	0
Southern Electricity Board	67	0	0
Southern Gas Board	36	15	0
Southwark, London Borough of	37	16	0
Southwick U.D.C.	6	6	0
Sowby, Dr. F. D.	1	1	0
Spoor, Dr. N. L.	1	1	0
Staines U.D.C.	8	8	0
Stansfield, A. F.	1	1	0
Stewart, R. E.	1	10	0
Stoddard, Dr. A.	2	0	0
Strood R.D.C. (2)	12	12	0
Stubbs, G. C.	1	1	0
Sturtevant Eng. Co., Ltd.	2	2	0
Sugg, Wm. & Co., Ltd.	2	2	0
Sullivan, J. S.	1	1	0
Sutherland, J. W.	1	1	0
Sutton, London Borough of	26	5	0
Swift, S.	1	1	0
Thomas, D. M. C.	1	1	0
Thurrock U.D.C.	26	5	0
Tiranti, A.		7	0
Todd, G. F.	2	2	0
Toussaint, Dr. C. H. C.	1	1	0
Tower Hamlets, London Borough of	26	5	0
Trianco Ltd.	15	15	0
Tunbridge Wells Corporation	1	1	0
Turner, Dr. W. C.	1	0	0
Vine, Mr. and Mrs. G. M.	2	2	0
Des Voeux, Mrs. M. F.	5	5	0
Waddell, A.		15	0
Watford Corporation	10	10	0
Watford R.D.C.	10	10	0
Watson, Professor H. E.	2	0	0
Wermann, J. C.	1	1	0
Westbrook, J.	1	1	0
Westminster, City of	37	16	0
*White Drummond & Co., Ltd.	3	3	0
White, Dr. H. D. J.	1	0	0
Wigan, H. N.	1	1	0
Willison, Mrs. M. E.	1	1	0
Windsor Corporation	8	8	0
Windsor R.D.C.	6	6	0
Winkworth, Mrs. D. M.		5	0
Women's Advisory Council on Solid Fuel	15	15	0
Women's Gas Federation	26	5	0
Woodall-Duckham Ltd.	26	5	0
Wormald, D.	1	1	0
Worthing Corporation	2	2	0
Wycombe R.D.C.	8	8	0

South Wales & Monmouth

	£	s.	d.
Abercarn U.D.C.	6	6	0
Abercwmboi Clean Air Committee	1	1	0
Aberdare U.D.C.	8	8	0
Abertillery U.D.C.	8	8	0
Barry Corporation	8	8	0
Bedwas & Machen U.D.C.	6	6	0
Bedwellty U.D.C.	8	8	0
Bridgend U.D.C.	6	6	0
Caerleon U.D.C.	6	6	0
Caerphilly U.D.C.	8	8	0
Cardiff Corporation	37	16	0
Cardiff R.D.C.	8	8	0
Clarke, J. A.	1	5	0
Coal Merchants Federation of Wales	5	5	0
Cwmbran U.D.C.	6	6	0
Ebbw Vale U.D.C.	10	10	0
Gellygaer U.D.C.	8	8	0
Harry, T. W.	1	1	0
Llanelly Corporation	8	8	0
Llanelly R.D.C.	8	8	0
Llantrissant & Llantwit Fardre R.D.C.	8	8	0
Magor & St. Mellons R.D.C.	6	6	0
Merthyr Tydfil Corporation	10	10	0
Monmouthshire County Council	37	16	0
Mountain Ash U.D.C.	8	8	0
Mynyddislwyn U.D.C.	6	6	0
Neath Corporation	8	8	0
Newport Corporation	26	5	0
Penarth U.D.C.	6	6	0
Pontypool U.D.C.	8	8	0
Pontypridd U.D.C.	8	8	0
Port Talbot Corporation	8	8	0
Rhondda Corporation	26	5	0
Silburn, Mrs. E.	1	1	0
South Wales Electricity Board	40	0	0
Steel Company of Wales Ltd.	50	0	0
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Wales Gas Board	26	5	0
Ystradgynlais R.D.C.	6	6	0

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85-87 Jermyn Street, London, S.W.1 (01-930-3541). ("*Sirocco*".)

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Norris House, 611 Stretford Road, Manchester, 15 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 611071).
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Visco Ltd., Stafford Road, Croydon, CR9 4DT (01-686 3861/9).

AIR STERILIZATION

W.H.S. (Pathfinder) Ltd., Brockhampton Lane, Havant, Hampshire (Havant 3661). (Cable address: Pathfinder, Portsmouth). ("*Pathfinder*".)

AUTOMATIC CONTROL EQUIPMENT

Photoelectronics (Arcall) Ltd., 92 Oldfields Road, Sutton, Surrey (Fairlands 4571).

BOILERS, DOMESTIC

Radiation Central Heating Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (01-459 1234).

Thomas Potterton Ltd., 20-30 Buckhold Road, London, S.W.18 (Vandyke 7202).

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Vauxhall Boiler Co. Ltd., Beaumont Road, Banbury, Oxfordshire (OBY 5-3437). (*Ambassador, Series Flow, Bouellat, Chute-O-Matic, and Vauxhall Joseph Goder Incinerators.*)

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Rutland House, 148 Edmund Street, Birmingham, 3 (Central 6131).
Aylward House, Wine Street, Bristol, 1 (Bristol (C) 294561).
54 West Nile Street, Glasgow C.1 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 8326)
Norfolk House, Grey Street, Newcastle-upon-Tyne (Newcastle 29212).

T. G. Binner (Boilers) Ltd., New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

Cochran & Co. (Annan) Ltd., Annan, Dumfriesshire, Scotland (Annan 2111).
Leslie Court, 22-23 Strutton Ground, Westminster, London, S.W.1 (01-222 4441).
Wharton Road, Winsford, Cheshire (Winsford 2298).
5 St. Vincent Place, Glasgow, C.1 (Central 4929). (*Boilers, Industrial.*)

Cradley Boiler Co. Ltd., Cradley Heath Staffordshire (Cradley Heath 66003/5) ("*Steampacket*" *Packaged Boilers.*)

Edwin Danks & Co. (Oldbury) Ltd., P.O. Box 4, Oldbury, Birmingham (Broadwell 2531).

Marshall Sons & Co. Ltd., Britannia Works, Gainsborough, Lincolnshire (Gainsborough 2301). (*Marshall Automatic Boilers.*)

Thomas Potterton Ltd., 20/30 Buckhold Road, London, S.W.18 (Vandyke 7202).

J. Stone & Co. (Deptford) Ltd., Arklow Road, Deptford, London, S.E.14 (Tideway 1202).
51 Summer Row, Birmingham 3 (Central 9385).
Bleasby Street, Oldham, Lancashire (Main 5421).
Bulldale Street, Yoker, Glasgow, W.4 (Scotstoun 3401). (*Stone-Vapor Boilers.*)

Vauxhall Boiler Co. Ltd., Beaumont Road, Banbury, Oxfordshire (OBY5-3437). (*Ambassador, Series Flow, Bouellat, Chute-O-Matic, and Vauxhall Joseph Goder Incinerators.*)

BOILERS PACKAGED (GAS-FIRED)

J. Stone & Co. (Deptford) Ltd., Arklow Road, Deptford, London, S.E.14 (Tideway 1202).

51 Summer Row, Birmingham, 3 (Central 9385).
Bleasby Street, Oldham, Lancashire (Main 5421).
Bulldale Street, Yoker, Glasgow, W.4 (Scotstoun 3401). (*Stone-Vapor Boilers.*)

BOILERS, INDUSTRIAL (SOLID FUEL)

Cochran & Co. (Annan) Ltd., Annan, Dumfriesshire, Scotland (Annan 2111).
Leslie Court, 22-23 Strutton Ground, Westminster, London, S.W.1 (01-222 4441).
Wharton Road, Winsford, Cheshire (Winsford 2298).
5 St. Vincent Place, Glasgow, C.1 (Central 4929). (*Boilers, Industrial.*)

Cradley Boiler Co. Ltd., Cradley Heath, Staffordshire (Cradley Heath 66003/5). ("*Steampacket*" *Packaged Boilers.*)

Edwin Danks & Co. (Oldbury) Ltd., P.O. Box 4, Oldbury, Birmingham (Broadwell 2531).

Vauxhall Boiler Co. Ltd., Beaumont Road, Banbury, Oxfordshire (OBY5 3437). (*Ambassador, Series Flow, Bouellat, Chute-O-Matic, and Vauxhall Joseph Goder Incinerators.*)

BOILERS, PACKAGED (OIL-FIRED)

Auto Combustions (London) Ltd., 360-364 Wandsworth Road, London, S.W.8 (Mac 9121). (*Oil firing equipment.*)

T. G. Binner (Boilers) Ltd., New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

Cochran & Co. (Annan) Ltd., Annan, Dumfriesshire, Scotland (Annan 2111).
Leslie Court, 22-23 Strutton Ground, Westminster, London, S.W.1 (01-222 4441).
Wharton Road, Winsford, Cheshire (Winsford 2298).
5 St. Vincent Place, Glasgow, C.1 (Central 4929). (*Boilers, Industrial.*)

Cradley Boiler Co. Ltd., Cradley Heath, Staffordshire (Cradley Heath 66003/5). ("*Steampacket*" *Packaged Boilers.*)

Edwin Danks & Co. (Oldbury) Ltd., P.O. Box 4, Oldbury, Birmingham (Broadwell 2531).

J. Stone & Co. (Deptford) Ltd., Arklow Road, Deptford, London, S.E.14 (Tideway 1202).
51 Summer Row, Birmingham, 3 (Central 9385).
Bleasby Street, Oldham, Lancashire (Main 5421).
Bulldale Street, Yoker, Glasgow, W.4 (Scotstoun 3401). (*Stone-Vapor Boilers.*)

Vauxhall Boiler Co. Ltd., Beaumont Road, Banbury, Oxfordshire (OBY5-3437). (*Ambassador, Series Flow, Bouellat, Chute-O-Matic, and Vauxhall Joseph Goder Incinerators.*)

BRICK AND FLUECAST CONCRETE CHIMNEYS

The Chimney Construction Co. Ltd., Hagley Road, Stourbridge, Worcestershire (Stourbridge 5623).

BRICKWORK, BOILER SETTING

The Chimney Construction Co. Ltd., Hagley Road, Stourbridge, Worcestershire (Stourbridge 5623).

BURNERS, GAS

Auto Combustions (London) Ltd., 360-364 Wandsworth Road, London, S.W.8 (MACaulay 9121). (*Oil firing equipment.*)

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (01-387 4321).
Rutland House, 148 Edmund Street, Birmingham 3 (CENtral 6131).
Aylward House, Wine Street, Bristol, 1 (Bristol (C) 294561).
54 West Nile Street, Glasgow C.1 (Central 9932).
Peter House, Oxford Street, Manchester 1 (Central 8326).
Norfolk House, Grey Street, Newcastle-upon-Tyne (Newcastle 29212).

Hamworthy Engineering Ltd., Combustion Division, Fleets Corner, Poole, Dorset (Poole 5123). (*Oil and Gas Burners.*)

Hope's Heating & Eng. Ltd., Halford Works, Smethwick, Birmingham, 40 (Smethwick 2191).
16 Berners Street, London, W.1 (Museum 8412).
8 Cumberland Road, Leeds, 6 (Leeds 59331).
31 The Parade, Cardiff (Cardiff 23581/2).
7 Pier Street, Hull (Hull Central 35346).

BURNERS, OIL

Auto Combustion (London) Ltd., 360-364 Wandsworth Road, London, S.W.8 (MACaulay 9121). (*Oil firing equipment.*)

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (01-387 4321).
Rutland House, 148 Edmund Street, Birmingham 3 (Central 6131).
Aylward House, Wine Street, Bristol, 1 (Bristol (C) 294561).
54 West Nile Street, Glasgow C.1 (Central 9932)
Peter House, Oxford Street, Manchester 1 (Central 8326).
Norfolk House, Grey Street, Newcastle-upon-Tyne (Newcastle 29212).

Edwin Danks & Co. (Oldbury) Ltd., P.O. Box 4, Oldbury, Birmingham (Broadwell 2531).

Hamworthy Engineering Ltd., Combustion Division, Fleets Corner, Poole, Dorset (Poole 5123). (*Oil and Gas Burners.*)

Hope's Heating & Eng. Ltd., Halford Works, Smethwick, Birmingham, 40 (Smethwick 2191).
16 Berners Street, London, W.1 (Museum 8412).
8 Cumberland Road, Leeds, 6 (Leeds 59331).
31 The Parade, Cardiff (Cardiff 23581/2).
7 Pier Street, Hull (Hull Central 35346).

Riley (IC) Products Ltd., 19 Woburn Place, London, W.C.1 (TERminus 2622).

BURNERS, SOLID FUEL

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (01-387 4321).
Rutland House, 148 Edmund Street, Birmingham 3 (Central 6131).
Aylward House, Wine Street, Bristol, 1 (Bristol (C) 294561).
54 West Nile Street, Glasgow C.1 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 8326).
Norfolk House, Grey Street, Newcastle-upon-Tyne (Newcastle 29212).

Riley (IC) Products Ltd., 19 Woburn Place, London, W.C.1 (TERminus 2622).

CEILINGS HEATED

Norris Warming Co. Ltd., Burley House, 5/11 Theobalds Road, London, W.C.1 (HOLborn 7833).
2/3 Melrose Avenue, Clifton 8, Bristol (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester 15 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

CENTRAL HEATING SYSTEMS

W. G. Cannon & Sons Ltd., Carolyn House, Dingwall Road, Croydon, Surrey (Croydon 2201).
24 The Grove, Gosforth, Newcastle-upon-Tyne 3 (Gosforth 53847).

Norris Warming Co. Ltd., Burley House, 5/11 Theobalds Road, London, W.C.1 (HOLborn 7833).
2/3 Melrose Avenue, Clifton 8, Bristol (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester 15 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

Radiation Central Heating Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (01-459 1234).

CENTRAL OIL DISTRIBUTION SYSTEMS

E. G. Reeve & Sons Ltd., Burton Road, St. Faiths Industrial Est, Norwich, Norfolk, NOR 84N (Norwich 47228).

CHIMNEYS

F. E. Beaumont Ltd., 462/480 Rathgar Road, Brixton, London, S.W.9 (Brixton 4066) Telex 25837.
Midlands Office, 28 Birmingham Street, Oldbury, Broadwell (Broadwell 3938) Telex 338146. ("*Beauvent*"/"*Beauval*".)

Cochran & Co. (Annan) Ltd., Annan, Dumfriesshire, Scotland (Annan 2111).
Leslie Court, 22-23 Strutton Ground, Westminster, London, S.W.1 (01-222 4441).

Wharton Road, Winsford, Cheshire (Winsford 2298).
5 St. Vincent Place, Glasgow, C.1 (Central 4929). (*Boilers, Industrial.*)

The Constructional Eng. Co. Ltd., Titan Works, Charles Henry Street, Birmingham 12 (021-643 4041). ("*Titan*" *and* "*Titan-Zschocke*".)

Edwin Danks & Co. (Oldbury) Ltd., P.O. Box 4, Oldbury, Birmingham (Broadwell 2531).

E. G. Reeve & Sons Ltd., Burton Road, St. Faiths Industrial Est, Norwich (Norfolk, NOR 84N (Norwich 47228).

Rodway & Taylor (Birmingham) Ltd., 85-90 Buckingham Street, Birmingham, 19 (Central 4027/8).

Steel Chimneys Ltd., P.O. Box 1, New Hall Works, Lower Edge Road, Elland (Elland 2431).

Tipton Tub & Tube Co. Ltd., Bloomfield Road, Tipton, Staffs (Tipton 1011 & 3418).

CHIMNEY CLADDING (ALUMINIUM)

F. E. Beaumont Ltd., 462-480 Rathgar Road, Brixton, London, S.W.9 (Brixton 4066) (Telex 25837).
Midlands Office, 28 Birmingham Street, Oldbury, Broadwell (Broadwell 3938) (Telex 338146. ("*Beauvent*"/"*Beauval*".)

Rodway & Taylor (Birmingham) Ltd., 85-90 Buckingham Street, Birmingham, 19 (Central 4027/8).

Steel Chimneys Ltd., P.O. Box No. 1, New Hall Works, Lower Edge Road, Elland (Elland 2431).

CLEAN ROOMS

Air Movement Ltd., Dover Road, Northfleet, Kent (Gravesend 64844).

John Bass Ltd., Fleming Way, Crawley, Sussex (Crawley 28765). ("*Bassaire*".)

Constant Air Systems Ltd., Raebarn House, Northolt Road, Harrow, Middlesex (01-864 0288).
Wolverley House, Digbeth, Birmingham, 5 (021-643 5148).

Norris Warming Co. Ltd., Burley House, 5/11 Theobalds Road, London, W.C.1 (HOLborn 7833).
2/3 Melrose Avenue, Clifton 8, Bristol (Bristol 30261).
Norris House, 611 Stretford Road, Manchester, 15 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

W.H.S. (Pathfinder) Ltd., Brockhampton Lane, Havant, Hampshire (Havant 3661) (Cable address: Pathfinder, Portsmouth). ("*Pathfinder*".)

COAL HANDLING PLANT

Buell Ltd., 8-10 Minerva Road, North Acton, London, N.W.10 (Elgar 1761).

Edwin Danks & Co. (Oldbury) Ltd., P.O. Box 4, Oldbury, Birmingham (Broadwell 2531).

John Thompson (Triumph) Ltd., Triumph Works, Kirstall Road, Leeds, 3 (Leeds 34841).

COMBUSTION TESTING EQUIPMENT

Shandon Scientific Co. Ltd., 65 Pound Lane, London, N.W.10 (01-459 8671). ("*Fyrite*" *CO_2 indicator,* "*True Spot*" *smoke tester,* "*MZF*" *draft gauge,* "*Bacharach*" *combustion testing equipment.*)

CONTRACTORS, HEATING, VENTILATING AND AIR CONDITIONING

Adams & Adams, 4 Carlton Crescent, Southampton (Southampton 22602). (*Heating, Ventilating and Air Conditioning.*)

John Bass Ltd., Fleming Way, Crawley, Sussex (Crawley 28765). ("*Bassaire*".)

W. G. Cannon & Sons Ltd., Carolyn House, Dingwall Road, Croydon, Surrey (Croydon 2201).
24 The Grove, Gosforth, Newcastle-upon-Tyne, 3 (Gosforth 53847).

Carrier Engineering Company Ltd., Carrier House, Warwick Row, London, S.W.1 (VICtoria 6858).

Constant Air Systems Ltd., Raebarn House, Northolt Road, Harrow, Middlesex (01-864 0288).
Wolverley House, Digbeth, Birmingham, 5 (021-643 5148).

Fan Application & Engineering Ltd., 76 Rivington Street, London, E.C.2 (01-739 9329).

Alfred Grindrod & Co. Ltd., 122-134 Charles Street, Sheffield, 1 (Sheffield 27591).

Heat & Air Systems Ltd., 155 Clarence Street, Kingston-upon-Thames (Kingston 2446).
Tiviotdale Chambers, Lancashire Hill, Stockport, Cheshire (Stockport 4679). (*Heating, Air Conditioning and Ventilating Engineers.*)

Hope's Heating & Eng. Ltd., Halford Works, Smethwick, Birmingham, 40 (Smethwick 2191).
16 Berners Street, London, W.1 (Museum 8412).
8 Cumberland Road, Leeds, 6 (Leeds 59331).
31 The Parade, Cardiff (Cardiff 23581/2).
7 Pier Street, Hull (Hull Central 35346).

Morgan Air Treatments Ltd., Darwin Street, Birmingham, 12 (Victoria 2096). ("*Morganair*".)

Norris Warming Co. Ltd., Burley House, 5/11 Theobalds Road, London, W.C.1 (HOLborn 7833).
2/3 Melrose Avenue, Clifton 8, Bristol (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 15 (Trafford Park 3454).
Cross House, Westgate Road, Newcastle (Newcastle 611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

W.H.S. (Pathfinder) Ltd., Brockhampton Lane, Havant, Hampshire (Havant 3661). ("*Pathfinder*.")
(Cable address: Pathfinder, Portsmouth).

CONVECTORS

F. A. Borchardt Ltd., Mill Lane, Old Swan, Liverpool, 13 (Huyton 2268). (*Drugasar.*)

Dimplex Ltd., Millbrook, Southampton (Southampton 74425). (*Dimplex Electric Heating Appliances.*)

Charles Lathe & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffordshire (Tipton 1887). ("*Claco*".)

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (01-459 1234). (*Gas Fires.*)

COOLERS

Buell Ltd., 8-10 Minerva Road, North Acton, London, N.W.10 (Elgar 1761).

The Constructional Eng. Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (021-643 4041). ("*Titan*" *and* "*Titan-Zschocke*".)

Heenan & Froude Ltd., Shrub Hill, Worcester (Worcester 23461).

Visco Ltd., Stafford Road, Croydon, CR9 4DT (01-686 3861/9).

DAMPERS

Metropolitan Eng. Co. Ltd., Metro-Flex Works, 14 Earl Cottages, Earl Road, London, S.E.1 (Bermondsey 4331/2).

DEHUMIDIFIERS

Heather Filters Ltd., 7 Kendall Place, Baker Street, London, W.1 (01-486 1801). ("*Humexair*".)

DISCHARGE VALVES

Buell Ltd., 8-10 Minerva Road, North Acton, London, N.W.10 (Elgar 1761).

Nailsea Engineering Co. Ltd., Samlesbury Airfield, Near Blackburn, Lancashire (Mellor 666 Telex 63146). (*Reverse jet filters,* "*Pnu-Jet*".)

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (01-546 7799). (*Dust Control and Collecting Systems.*)

DUCTING

Keith Blackman Ltd., Mill Mead Road, London, N.17 (Tottenham 4522).
("*Tornado*", "*Tornado-Fischer*", "*Velocone*", "*Hydro Precipitator*".)

W. G. Cannon & Sons Ltd., Carolyn House, Dingwall Road, Croydon, Surrey (Croydon 2201).
24 The Grove, Gosforth, Newcastle-upon-Tyne, 3 (Gosforth 53847).

The Constructional Eng. Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (021-643 4041). ("*Titan*" *and* "*Titan-Zschocke*".)

Morgan Air Treatments Ltd., Darwin Street, Birmingham, 12 (Victoria 2096). ("*Morganair*".)

Radiation Central Heating Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (01-459 1234).

Tipton Tub & Tube Co, Ltd., Bloomfield Road, Tipton, Staffordshire (Tipton 1011 and 3418).

W.H.S. (Pathfinder) Ltd., Brockhampton Lane, Havant, Hampshire (Havant 3661), (Cable address: Pathfinder, Portsmouth). ("*Pathfinder*".)

DUST CLASSIFICATION PLANT

Buell Ltd., 8/10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761).

DUST COLLECTION EQUIPMENT AND PLANT

Ambuco Ltd., 38/40 Featherstone Street, London, E.C.1 (01-253 7573)
N. H. Macdonald, Mansion House Chambers, Close, Newcastle-upon-Tyne, 1.
Dron & Dickson Ltd., 31 Kelvin Grove Street, Glasgow C.3.
(*Industrial Dust Recovery and Fume Clearing plant.*)

Alldays & Onions Ltd., P.O. Box 234, Great Western Works, Sydenham Road, Birmingham 11 (Victoria 2551/4).

August's Ltd., Exmoor Street, Halifax, Yorkshire (Halifax 61245). (*August-National Hydro-Filter.*)

Berk Ltd., Eng. Division, Paramount House, 75 Uxbridge Road, Ealing, W.5 (Ealing 9251).

Keith Blackman Ltd., Mill Mead Road, London, N.17 (Tottenham 4522). ("*Tornado*" "*Tornado-Fischer*" "*Velocone*" *Hydro Precipitator*".)

The British Ceca Co. Ltd., 175 Piccadilly, London, W.1 (HYDe Park 5131). ("*Ceca-filter*" *reverse-jet sleeve filter.*)

Buell Ltd., 8/10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761).

Centri-Spray Ltd., Green Dragon House, 64/70 High Street, Croydon, Surrey (01-688 7431 Telex 261251).
Centri-Spray G.M.B.H., Neue Wyerstrasse 10, 5 Cologne, (Lloyd Haus), W. Germany (23 59 28. Telex 8882415).
Centri-Spray S.A.R.L., 88 Avenue Victor Hugo, Paris 16 eme, France (704 3066. Telex 62150).
(*Centri-Spray Air Washers.*)

Chemical Construction (G.B.) Ltd., Regal House, Twickenham, Middlesex (POPesgrove 4455). (*Chemico Pease Anthony Venturi Scrubbers.*)

Collectron (Sales) Ltd., 175 Leckhampton Road, Cheltenham, Gloucester (Cheltenham 56355).

Constant Air Systems Ltd., Raebarn House, Northolt Road, Harrow, Middlesex (01-864 0288).
Wolverley House, Digbeth, Birmingham, 5 (021-643 5148).

The Constructional Eng. Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (021-643 4041). ("*Titan*" *and* "*Titan-Zschocke*".)

Drummond Dust & Fume Extractors Ltd., Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (LARkswood 4441).

Dust Control Equipment Ltd., Thurmaston, Leicester (Syston 3333). (*Dust Control Equipment for Industry.*)

Fan Application & Engineering Ltd., 76 Rivington Street, London, E.C.2 (01-739 9329).

Goblin (B.V.C.) Ltd., Goblin Works, Leatherhead, Surrey (Ashtead 6121).

Harris Engineering Co. Ltd., York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19/20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester 1 (Central 3546/7).
Wellington House, 103/105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent. (Tunbridge Wells 23401/8. Telex 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6. Telex 74621).
(*Manufacturers of Industrial Space Heating and Air Cleaning Equipment.*)

Heat & Air Systems Ltd., 155 Clarence Street, Kingston-upon-Thames (Kingston 2446).
Tiviotdale Chambers, Lancashire Hill, Stockport, Cheshire (Stockport 4679). (*Heating, Air Conditioning and Ventilating Engineers.*)

Longhurst Bros & Beale Ltd., Polygon Works, Poyle Estate, Colnbrook, Buckinghamshire (Colnbrook 2185). (*Impulsitor "Elite".*)

Mikropul Ltd., Towerfield Industrial Estate, Shoeburyness, Essex (2373-4-5). (*Dust Collection Equipment.*)

Morgan Air Treatments Ltd., Darwin Street, Birmingham, 12 (Victoria 2096). ("*Morgan-air*".)

Nailsea Engineering Co. Ltd., Samlesbury Airfield, Near Blackburn, Lancashire (Mellor 666. Telex 63146). (*Reverse jet filter, "Pnu-Jet".*)

R. J. Richardson & Sons Ltd., Engineering & Shotblast Works, 37 Commercial Street, Birmingham, 1 (Midland 2281 [P.B.X.])

Rodway & Taylor (Birmingham) Ltd., 85-90 Buckingham Street, Birmingham, 19 (Central 4027/8).

Spencer & Halstead Ltd., Ossett, Yorkshire (Ossett 821).
84 High Street, Cradley Heath, Staffordshire (Cradley Heath 66816).
Spenstead House, Ashley Road, Epsom (Epsom 27101).
(*Spenstead.*)

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (01-546 7799). (*Dust Control and Collecting Systems.*)

Tilghman Wheelabrator Ltd., Broadheath, Altrincham, Cheshire (061 ALT 4242. Telex 668945).

Visco Ltd., Stafford Road, Croydon CR9 4DT (01-686 3861/9).

Western Precipitation Division Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711). (*Electrostatic precipitators, mechanical collectors wet scrubbers, dust valves.*)

DUST SAMPLING EQUIPMENT

Airflow Developments Ltd., Lancaster Road, High Wycombe, Buckinghamshire (OHW4 25252).

W. & R. Balston Ltd., Sole Sales Agents: H. Reeve Angel & Co. Ltd., 14 New Bridge Street, London, E.C.4 (Fleet 9833). ("*Whatman*" *Filter Papers, Dust Sampling Media and Filter Tubes.*)

C. F. Casella & Co. Ltd., Regent House, Britannia Walk, London, N.1 (Clerkenwell 8581 [six lines]). (*Scientific Instruments.*)

Fleming Instruments Ltd., Caxton Way, Stevenage, Hertfordshire (Stevenage 3101-5).

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (01-546 7799). (*Dust Control and Collecting Systems.*)

ELECTRIC HEATING EQUIPMENT

Dimplex Ltd., Millbrook, Southampton (Southampton 74425). (*Dimplex Electric Heating Appliances.*)

Isopad Ltd., Barnet By-Pass, Borehamwood, Hertfordshire (Elstree 2817).

ELECTRICAL PRECIPITATORS

The Constructional Eng. Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (021-643 4041). ("*Titan*" *and* "*Titan-Zschocke*".)

Head Wrightson Iron & Steel Works Eng. Ltd., Teesdale Iron Works, P.O. Box 10, Thornaby on Tees, Stockton on Tees, Co. Durham (Stockton on Tees 62241).

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (01-272 0233).

Visco Ltd., Stafford Road, Croydon CR9 4DT (01-686 3861/9).

Western Precipitation Division Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711). (*Electrostatic precipitators, mechanical collectors, wet scrubbers, dust valves.*)

ELECTRICAL PRECIPITATORS MAINTENANCE

Pionex Ltd., Werneth House, Hyde, Cheshire (Hyde 3969).

ELECTRIC UNIT STORAGE HEATERS

Dimplex Ltd., Millbrook, Southampton (Southampton 74425). (*Dimplex Electric Heating Appliances.*)

EXHIBITION AND DISPLAY CONTRACTORS

Princedale Electrical Co. Ltd., 205/207 Warwick Road, Kensington, W.14 (EMPress 8284/5).

FANS

Airflow Development Ltd., Lancaster Road, High Wycombe, Buckinghamshire (OHW4 25252).

Alldays & Onions Ltd., P.O. Box 234, Great Western Works, Sydenham Road, Birmingham 11 (Victoria 2551/4).

Davidson & Co. Ltd., Sirocco Engineering Works, Belfast, Northern Ireland (Belfast 57251).
85/87 Jermyn Street, London, S.W.1 (930-3541).
(*Sirocco*.)

Longhurst Bros. & Beale Ltd., Polygon Works, Colnbrook, Buckinghamshire (Colnbrook 2185). (*Impulsitor "Elite"*.)

Spencer & Halstead Ltd., Ossett, Yorkshire (Ossett 821).
84 High Street, Cradley Heath, Staffordshire (Cradley Heath 66816). (*Spenstead*.)
Spenstead House, Ashley Road, Epsom (Epsom 27101).

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (01-272 0233).

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey. (*Dust Control and Collecting Systems*.) (01-546 7799).

FILTERS, AIR

Keith Blackman Ltd., Mill Mead Road, London, N.17 (Tottenham 4522). ("*Tornado*" "*Tornado-Fischer*" "*Velocone*" "*Hydro Precipitator*".)

Centri-Spray Ltd., Green Dragon House, 64-70 High Street, Croydon, Surrey (01-688 7431. Telex 261251).
Centri-Spray G.M.B.H., Neue Wyerstrasse 10, 5 Cologne, (Lloyd Haus) W. Germany (23 59 28. Telex 8882415).
Centri-Spray S.A.R.L., 88 Avenue Victor Hugo, Paris 16 eme, France (704 3066. Telex 62150).
(*Centri-Spray Air Washers*.)

Harris Engineering Co. Ltd., York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19/20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103/105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8. Telex 95181).
Killowen Street, Coleraine, N. Ireland (Coleraine 2315/6. Telex 74621).
(*Manufacturers of Industrial Space Heating and Air Cleaning Equipment*.)

FILTERS AIR

Heather Filters Ltd., 7 Kendall Place, Baker Street, London, W.1 (01-486 1801). ("*Multi-Brush*".)

Jobson & Beckwith Ltd., 62 Southwark Bridge Road, London, S.E.1 (Waterloo 7102) (*Fram Air Filters*.)

Luwa (UK) Ltd., 36-41 High Street, South Norwood, London, S.E.25 (LIVingstone 6515).

Machine Control Ltd., Blatchford Road, Horsham, Sussex (Horsham 3215).
Old Road, Southam, Near Leamington Spa, Warwickshire (Southam 2419 and 623).
11 Baliol Street, Glasgow C.3 (Douglas 4376).
("*Emcel*" *Air Filters*, "*Emcel*" *Air Purifiers*, "*Emcel*" *Clean Air Supply Units*.)

Nailsea Engineering Co. Ltd., Samlesbury Airfield, Near Blackburn, Lancashire (Mellor 666. Telex 63146). (*Reverse jet filters*, "*Pnu-Jet*".)

Tilghman Wheelabrator Ltd., Broadheath, Altrincham, Cheshire (061 ALT 4242. Telex 668945).

Visco Ltd., Stafford Road, Croydon, CR9 4DT (01-686 3861/9).

FILTERS, AIR, ELECTROSTATIC, PAPER, VISCOUS

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (01-272 0233).

FIRE LIGHTERS (ELECTRIC)

Best Products Ltd., Ranelagh House, Felixstowe, Suffolk (Felixstowe 3154/5/6). ("*Matchless*" *Firelighter.*)

FLUE ASH AND CLINKER CONVEYING PLANT

Goblin (B.V.C.) Ltd., Goblin Works, Leatherhead, Surrey (Ashtead 6121).

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (01-272 0233).

John Thompson (Triumph) Ltd., Triumph Works, Kirkstall Road, Leeds, 3 (Leeds 34841).

FLUE DUST EXTRACTION PLANT

Keith Blackman Ltd., Mill Mead Road, London, N.17 (Tottenham 4522). ("*Tornado*" "*Tornado-Fischer*" "*Velocone*" "*Hydro Precipitator*".)

Buell Ltd., 8/10 Minerva Road, North Acton, London, N.W.10 (Elgar 1761).

Collectron (Sales) Ltd., 175 Leckhampton Road, Cheltenham, Gloucester (Cheltenham 56355).

Centri-Spray Ltd., Green Dragon House, 64-70 High Street, Croydon, Surrey (01-688 7431. Telex 261251).
Centri-Spray G.M.B.H., Neue Wyerstrasse 10, 5 Cologne, (Lloyd Haus), W. Germany (23 59 28. Telex 8882415).
Centri-Spray S.A.R.L., 88 Avenue Victor Hugo, Paris 16 eme, France (704 3066. Telex 62150).
(*Centri-Spray Air Washers.*)

The Constructional Eng. Co. Ltd., Titan Works, Charles Henry Street, Birmingham 12 (021-643-4041). ("*Titan*" *and* "*Titan-Zschocke*".)

Davidson & Co. Ltd., Sirocco Eng. Works, Belfast, Northern Ireland (Belfast 57251).
85/87 Jermyn Street, London, S.W1 (930-3541).
("*Sirocco*".)

Goblin (B.V.C.) Ltd., Goblin Works, Leatherhead, Surrey (Ashtead 6121).

Head Wrightson Iron & Steel Works Eng. Ltd., Teesdale Iron Works, P.O. Box 10, Thornaby on Tees, Stockton on Tees, Co. Durham (Stockton on Tees 62241).

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (01-546 7799). (*Dust Control and Collecting Systems.*)

FLUE DUST EXTRACTION PLANT, PNEUMATIC

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (01-272 0233).

FLUE GAS DUST MONITORING DEVICE (C.E.G.B. TYPE)

Photoelectronics (Arcall) Ltd., 92 Oldfields Road, Sutton, Surrey (Fairlands 4571).

Airflow Developments Ltd., Lancaster Road, High Wycombe, Buckinghamshire (OHW4 25252).

FLUE GAS DUST SAMPLING EQUIPMENT (B.C.U.R.A. TYPE)

Airflow Developments Ltd., Lancaster Road, High Wycombe, Buckinghamshire (OHW4 25252).

FLUE GAS TREATMENT

D.C.P. Systems Ltd., Centre Heights, 137 Finchley Road, London, N.W.3 (JUNiper 1121).

FLUE HEATERS BALANCED

F. A. Borchardt Ltd., Mill Lane, Old Swan, Liverpool, 13 (Huyton 2268). (*Drugasar.*)

FUEL EFFICIENCY ADVISORY SERVICE

National Industrial Fuel Efficiency Service, 71 Grosvenor Street, London, W.1 (01-493 9706).

FUEL—GAS

Eastern Gas Board, Clarendon Road, Watford (Watford 28555).

East Midlands Gas Board, De Montford Street, Leicester (Leicester 50022).

The Gas Council, 4/5 Grosvenor Place, London, S.W.1 (Belgravia 4321).

Northern Gas Board, P.O. Box 1, G.B., Newcastle-upon-Tyne (Newcastle-upon-Tyne 663322).

North Eastern Gas Board, New York Road, Leeds (Leeds 36291).

North Thames Gas Board, 30 Kensington Church Street, London, W.8 (Western 8141).

North Western Gas Board, Welman House, Altrincham, Cheshire (Altrincham 6311).

Scottish Gas Board, 26 Drumsheugh Gardens, Edinburgh, 3 (Caledonian 2052/7).

South Eastern Gas Board, Katharine Street, Croydon, Surrey (Croydon 4466).

Southern Gas Board, 164 Above Bar, Southampton (Southampton 75544).

South Western Gas Board, 9a Quiet Street, Bath (Bath 60411).

Wales Gas Board, Snelling House, Bute Terrace, Cardiff (Cardiff 33131).

West Midlands Gas Board, Wharf Lane, Solihull, Warwickshire (Solihull 6888).

FUEL—ELECTRICITY SUPPLY

Electricity Council, 30 Millbank, London, S.W.1 (01-834 2333).

Electricity Council (EDA Division), Trafalgar Buildings, 1 Charing Cross, London, S.W.1 (01-930 6757).

FUEL OIL STORAGE TANKS

E. G. Reeve & Sons Ltd., Burton Road, St. Faiths Industrial Est, Norwich, Norfolk, NOR 84N (Norwich 47228).

FUELS—SOLID SMOKELESS

Coalite & Chemical Products Ltd., P.O. Box 21, Chesterfield, Derbyshire (Bolsover 2281/6).
103 Mount Street, London, W.1 (GROsvenor 7931).
("*Coalite*" *Smokeless Coal.*)

National Carbonising Co. Ltd., Thorney House, 34 Smith Square, London, S.W.1 (ABBey 7331).
Fullarton Lodge, Crow Hill Drive, Mansfield, Nottinghamshire (Mansfield 22357).
("*Rexco*" *Smokeless Coal.*)

National Coal Board, Hobart House, Grosvenor Place, London, S.W.1 (BELgravia 2020). (*Sunbrite, Phurnacite, Homefire, Roomheat, Multiheat, Anthracite, Welsh Dry Steam.*)

FUME REMOVAL EQUIPMENT

Ambuco Ltd., 38/40 Featherstone Street, London, E.C.1 (01-253 7573).
N. H. Macdonald, Mansion House Chambers, Close, Newcastle-upon-Tyne, 1.
Dron & Dickson Ltd., 31 Kelvin Grove Street, Glasgow, C.3.
(*Industrial Dust Recovery and Fume Cleaning Plant.*)

Keith Blackman Ltd., Mill Mead Road, London, N.17 (Tottenham 4522). ("*Tornado*" "*Tornado-Fischer*" "*Velocone*" *Hydro Precipitator.*)

The British Ceca Co. Ltd., 175 Piccadilly, London, W.1 (HYDe Park 5131). ("*Oxycat*" *Catalytic Oxidiation.*)

Centri-Spray Ltd., Green Dragon House, 64-70 High Street, Croydon, Surrey (01-688 7431. Telex 261251).
Centri-Spray G.M.B.H., Neue Wyerstrasse 10, 5 Cologne, (Lloyd Haus), W. Germany (23 59 28. Telex 8882415).
Centri-Spray S.A.R.L., 88 Avenue Victor Hugo, Paris 16 eme, France (704 3066. Telex 62150).
(*Centri-Spray Air Washers.*)

Chemical Construction (GB) Ltd., Regal House, Twickenham, Middlesex (POPesgrove 4455). (*Chemico Pease Anthony Venturi Scrubbers.*)

Constant Air Systems Ltd., Raebarn House, Northolt Road, Harrow, Middlesex (01-864 0288).
Wolverley House, Digbeth, Birmingham, 5 (021-643 5148).

The Constructional Eng. Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (021-643 4041). ("*Titan*" *and* "*Titan-Zschocke*".)

Drummond Dust & Fume Extractors Ltd., Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (LARkswood 4441).

FUME REMOVAL EQUIPMENT

Fan Application & Engineering Ltd., 76 Rivington Street, London, E.C.2 (01-739 9329).

Head Wrightson Iron & Steel Works Eng. Ltd., Teesdale Iron Works, P.O. Box 10, Thornaby on Tees, Stockton on Tees, Co. Durham (Stockton on Tees 62241).

Kavag-Uop Air Correction Co. Ltd., 11/12 Pall Mall, London, S.W.1 (01-930 7911).
District Office, Somerset House, Georges Street, Halifax (Halifax 65109).

Longhurst Bros. & Beale Ltd., Polygon Works, Poyle Estate, Colnbrook, Buckinghamshire (Colnbrook 2185). (*Impulsitor* "*Elite*".)

Morgan Air Treatments Ltd., Darwin Street, Birmingham, 12 (Victoria 2096). ("*Morganair*".)

R. J. Richardson & Sons Ltd., Engineering and Shotblast Works, 37 Commercial Street, Birmingham, 1 (Midland 2281 [P.B.X.])

Spencer & Halstead Ltd., Ossett, Yorkshire (Ossett 821).
84 High Street, Cradley Heath, Staffordshire (Cradley Heath 66816).
Spenstead House, Ashley Road, Epsom (Epsom 27101). (*Spenstead.*)

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (01-546 7799). (*Dust Control and Collecting Systems.*)

Visco Ltd., Stafford Road, Croydon, CR9 4DT (01-686 3861/9).

Western Precipitation Division Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711). (*Electrostatic precipitators, mechanical collectors, wet scrubbers, dust valves.*)

FURNACES, KILN, OVENS, ETC.

R. M. Catterson-Smith Ltd., Adams Bridge Works, South Way, Exhibition Grounds, Wembley (Wembly 4291). (*Electric Furnaces.*)

The Constructional Eng. Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (021-643 4041). ("*Titan*" *and* "*Titan-Zschocke*".)

John Thompson (Triumph) Ltd., Triumph Works, Kirkstall Road, Leeds, 3 (Leeds 34841).

GAS CLEANING PLANT

The Constructional Eng. Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (021-643 4041). ("*Titan*" *and* "*Titan-Zschocke*".)

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (01-546 7799). (*Dust Control and Collecting Systems.*)

Western Precipitation Division Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711). (*Electrostatic precipitators, mechanical collectors wet scrubbers, dust valves.*)

GAS CLEANING PLANT, ELECTROSTATIC PRECIPITATORS, MECHANICAL COLLECTORS

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (01-272 0233).

GAS CLEANING PLANT MAINTENANCE

Pionex Ltd., Werneth House, Hyde, Cheshire (Hyde 3969).

GAS HEATING EQUIPMENT (BUTANE/PROPANE)

F. A. Borchardt Ltd., Mill Lane, Old Swan, Liverpool, 13 (Huyton 2268). (*Drugasar.*)

Harris Engineering Co. Ltd., York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19/20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).

Wellington House, 103/105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8. Telex 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6. Telex 74621).
(*Manufacturers of Industrial Space Heating and Air Cleaning Equipment.*)

GAS HEATING EQUIPMENT

Keith Blackman Ltd., Mill Mead Road, London, N.17 (Tottenham 4522). ("*Tornado*" "*Tornado-Fischer*" "*Velocone*" "*Hydro Precipitator*".)

F. A. Borchardt Ltd., Mill Lane, Old Swan, Liverpool, 13 (Huyton 2268). (*Drugasar.*)

Heat & Air Systems Ltd., 155 Clarence Street, Kingston-upon-Thames (Kingston 2446).
Tiviotdale Chambers, Lancashire Hill, Stockport, Cheshire (Stockport 4679).
(*Heating, Air Conditioning and Ventilating Engineers.*)

Radiation Central Heating Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (01-459 1234).

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (01-459-1234). (*Gas Fires.*)

GAS SCRUBBERS AND WASHERS

Ambuco Ltd., 38/40 Featherstone Street, London, E.C.1 (01-253 7573).
N. H. Macdonald, Mansion House Chambers, Close, Newcastle-upon-Tyne, 1.
Dron & Dickson Ltd., 31 Kelvin Grove Street, Glasgow, C.3.
(*Industrial Dust Recovery and Fume Cleaning Plant.*)

Keith Blackman Ltd., Mill Mead Road, London, N.17 (Tottenham 4522). ("*Tornado*" "*Tornado-Fischer*" "*Velocone*" "*Hydro Precipitator*".)

Chemical Construction (GB) Ltd., Regal House, Twickenham, Middlesex (POPesgrove 4455). (*Chemico Pease Anthony Venturi Scrubbers.*)

Collectron (Sales) Ltd., 175 Leckhampton Road, Cheltenham, Gloucestershire (Cheltenham 56355).

The Constructional Eng. Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (021-643 4041). ("*Titan*" *and* "*Titan-Zschocke*").

Drummond Dust & Fume Extractors Ltd., Byron Works, Blackhorse Lane, Walthamtow, London, E.17 (LARkswood 4441).

Head Wrightson Iron & Steel Works Eng. Ltd., Teesdale Iron Works, Thornaby on Tees, Stockton on Tees, Co. Durham (Stockton on Tees 62241).

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (01-546 7799). (*Dust Control and Collecting Systems.*)

Western Precipitation Division Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711). (*Electrostatic precipitators, mechanical collectors, wet scrubbers, dust valves.*)

GRIT ARRESTERS MAINTENANCE

Pionex Ltd., Werneth House, Hyde, Cheshire (Hyde 3969).

GRIT ARRESTERS

Ambuco Ltd., 38/40 Featherstone Street, London, E.C.1 (01-253 7573).
N. H. Macdonald, Mansion House Chambers, Close, Newcastle-upon-Tyne, 1.
Dron & Dickson Ltd., 31 Kelvin Grove Street, Glasgow, C.3.
(*Industrial Dust Recovery and Fume Cleaning Plant.*)

Alldays & Onions Ltd., P.O. Box 234, Great Western Works, Sydenham Road, Birmingham, 11 (Victoria 2551/4).

Keith Blackman Ltd., Mill Mead Road, London, N.17 (Tottenham 4522). ("*Tornado*" "*Tornado-Fischer*" "*Velocone*" "*Hydro Precipitator*".)

Buell Ltd., 8/10 Minerva Road, North Acton, London, N.W.10 (ELGar 1761).

Centri-Spray Ltd., Green Dragon House, 64/70 High Street, Croydon, Surrey (01-688 7431. Telex 261251).

Centri-Spray G.M.B.H., Neue Wyerstrasse 10, 5 Cologne, (Lloyd Haus), W. Germany (23 59 28. Telex 8882415).
Centri-Spray S.A.R.L., 88 Avenue Victor Hugo, Paris 16 eme, France (704 3066. Telex 62150).
(*Centri-Spray Air Washers.*)

The Constructional Eng. Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (021-643 4041). ("*Titan*" *and* "*Titan-Zschocke*".)

Fan Application & Engineering Ltd., 76 Rivington Street, London, E.C.2 (01-739 9329).

The Incinerator Co. Ltd., 14 Coopers Row, Tower Hill, London, E.C.3 (ROYal 9931 (5 lines)). ("*Scrubber type*".)

Thermix Industries Ltd., 143 Maple Road, Surbiton, Surrey (01-546 7799). (*Dust Control and Collecting Systems.*)

Tipton Tub & Tube Co. Ltd., Bloomfield Road, Tipton, Staffordshire (Tipton 1011 and 3418).

Western Precipitation Division, Joy Trading Corporation, 7 Harley Street, London, W.1 (LANgham 7711). (*Electrostatic precipitators, mechanical collectors, wet scrubbers, dust valves.*)

GRIT ARRESTERS, MECHANICAL COLLECTORS, ELECTROSTATIC PRECIPITATORS

Sturtevant Engineering Co. Ltd., Sturtevant House, Highgate Hill, London, N.19 (01-272 0233).

HEATERS, AIR

Auto Combustions (London) Ltd., 360-364 Wandsworth Road, London, S.W.8 (MACaulay 9121). (*Oil firing equipment.*)

The Constructional Eng. Co. Ltd., Titan Works, Charles Henry Street, Birmingham, 12 (021-643 4041). ("*Titan*" *and* "*Titan-Zschocke*".)

Harris Engineering Co. Ltd., York Works, Browning Street, London, S.E.17 (01-703-7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19/20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103/105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8. Telex 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6. Telex 74621).
(*Manufacturers of Industrial Space Heating and Air Cleaning Equipment.*)

Kavag-Uop Air Correction Co. Ltd., 11/12 Pall Mall, London, S.W.1 (01-930 7911).
Somerset House, Georges Street, Halifax (Halifax 65109).

Wanson Co. Ltd., 7 Elstree Way, Borehamwood, Hertfordshire (01-953 7111. Telex 261169). (*Thermobloc Air Heaters, oil- or gas-fired, 150,000-12,000,000 Btu/hr.*)

HEATERS ELECTRIC (FUEL EFFECT)

Dimplex Ltd., Millbrook, Southampton, Hampshire (Southampton 74425). (*Dimplex Electric Heating Appliances.*)

HEATERS, FAN

Harris Engineering Co. Ltd., York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19/20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103/105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8. Telex 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6. Telex 74621).
(*Manufacturers of Industrial Space Heating and Air Cleaning Equipment.*)

HEATERS INFRA-RED

Dimplex Ltd., Millbrook, Southampton (Southampton 74425). (*Dimplex Electric Heating Appliances.*)

Harris Engineering Co. Ltd., York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19/20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103/105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8. Telex 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6. Telex 74621).
(*Manufacturers of Industrial Space Heating and Air Cleaning Equipment.*)

HEATERS, LIQUID PHASE

Wanson Co. Ltd., 7 Elstree Way, Borehamwood, Hertfordshire (01-953 7111. Telex 261169). (*Thermopac Liquid Phase Heaters.*) (*Thermopac liquid phase process Heaters 280,000-4,000,000 Btu/hr.*)

HEATERS, WATER

Charles Lathe & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffordshire (Tipton 1887). ("*Claco*".)

HEATING EQUIPMENT, INDUSTRIAL (SPACE)

Harris Engineering Co. Ltd., York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19/20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103/105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8. Telex 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6. Telex 74621). (*Manufacturers of Industrial Space Heating and Air Cleaning Equipment.*)

HEATING EQUIPMENT, DOMESTIC

F. A. Borchardt Ltd., Mill Lane, Old Swan, Liverpool, 13 (HUYton 2268). (*DRUgasar.*)

Charles Lathe & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffs (Tipton 1887). ("*Claco*".)

Thomas Potterton Ltd., 20/30 Buckhold Road, London, S.W.18 (VAN 7202).

Radiation Central Heating Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (01-459 1234).

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (01-459 1234). (*Gas Fires.*)

Radiation Parkray Ltd., Radiation House, North Circular Road, London, N.W.10 (01-459 1234). (*Parkray Room Heaters.*)

HEATING EQUIPMENT, INDUSTRIAL (PROCESS SPACE)

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (01-387 4321).
Rutland House, 148 Edmund Street, Birmingham, 3 (Central 6131).
Aylward House, Wine Street, Bristol, 1 (Bristol (C) 294561).
54 West Nile Street, Glasgow, C.1 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 8326).
Norfolk House, Grey Street, Newcastle-upon-Tyne (Newcastle 29212).

W. G. Cannon & Sons Ltd., Carolyn House, Dingwall Road, Croydon, Surrey (Croydon 2201).
24 The Grove, Gosforth, Newcastle-upon-Tyne, 3 (Gosforth 53847).

R. M. Catterson-Smith Ltd., Adams Bridge Works, South Way, Exhibition Grounds, Wembley (Wembley 4291). (*Electric Furnaces.*)

Isopad Ltd., Barnet By-Pass, Boreham Wood, Herts. (Elstree 2817).

Longhurst Bros. & Beale Ltd., Polygon Works, Poyle Estate, Colnbrook, Bucks. (Colnbrook 2185). (*Impulsitor "Elite".*)

Thomas Potterton Ltd., 20/30 Buckhold Road, London, S.W.18 (VAN 7202).

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (01-459 1234). (*Gas Fires.*)

Spencer & Halstead Ltd., Ossett, Yorkshire (Ossett 821).
84 High Street, Cradley Heath, Staffs. (Cradley Heath 66816).
Spenstead House, Ashley Road, Epsom (Epsom 27101). (*Spenstead.*)

HEATING SYSTEMS, OIL

Harris Engineering Co. Ltd., York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19/20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103/105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8. Telex 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6. Telex 74621). (*Manufacfacturers of Industrial Space Heating and Air Cleaning Equipment.*)

HEATING TAPES (ELECTRIC)

Isopad Ltd., Barnet By-Pass, Boreham Wood, Herts. (Elstree 2817).

HEAT PUMPS

M. L. Engineering (Plymouth) Ltd., 292 Leigh Road, Trading Estate, Slough, Bucks. (Slough 23838).

HUMIDIFIERS

Heather Filters Ltd., 7 Kendall Place, Baker Street, London, W.1 (01-486 1801). ("*Satomair*".)

Spencer & Halstead Ltd., Ossett, Yorkshire (Ossett 821).
84 High Street, Cradley Heath, Staffs. (Cradley Heath 66816).
Spenstead House, Ashley Road, Epsom (Epsom 27101). (*Spenstead.*)

INCINERATORS

Bering Ltd., Doman Road, Camberley, Surrey (Camberley 4191). ("*Kleenaire*" *Incinerators.*)

Heenan & Froude Ltd., Shrub Hill, Worcester (Worcester 23461).

The Incinerator Co. Ltd., 14 Coopers Row, Tower Hill, London, E.C.3 (Royal 9931, 5 lines). (*Incinerators for all industrial and municipal wastes, cremators for animal wastes after burning units for furnaces of all types.*)

Kavag-Uop Air Correction Company Ltd., 11/12 Pall Mall, London, S.W.1 (01-930 7911).
Somerset House, Georges Street, Halifax (Halifax 65109).

G. F. Rider (Process Plant) Ltd., Leeds Place Works, Tollington Park, London, N.4 (01-272 0404/5/6).

Riley (IC) Products Ltd., 19 Woburn Place, London, W.C.1 (Terminus 2622).

Vauxhall Boiler Co. Ltd., Beaumont Road, Banbury, Oxfordshire (OBYS 3437). (*Ambassador, Series Flow, Bouellat, Chute-o-Matic and Vauxhall Joseph Goder Incinerators.*)

Victor Products (Wallsend) Ltd., G.P.O. Box 10, Wallsend, Northumberland (Wallsend 628331).
50 Pall Mall, London, S.W.1 (01-930 7142).
Victoria Chambers, Dale Road, Matlock, Derbyshire (Matlock 2287). (*Victor Incinerators.*)

INDICATORS

The General Electric Company Ltd., Witton-Kramer Division, Witton, Birmingham, 6 (021-327 1941). (*Photoelectric smoke-detection equipment.*)

INSTRUMENTS, GAUGES, METERS, ETC.

Airflow Developments Ltd., Lancaster Road, High Wycombe, Bucks. (OHW4 25252).

LECTURE, FILMSTRIPS & NOTES

National Society for Clean Air, Field House, Breams Buildings, London, E.C.4 (01-242 5038). (*Clean air notes for teachers and lecturers. Leaflets, posters.*)

Diana Wyllie Ltd., 3 Park Road, Baker Street, London, N.W.1 (01-723 3330 and 7333).

OIL BURNERS FULLY AUTOMATIC

Quiet May Oil Burner Ltd., Lion House, 72-75 Red Lion Street, London, W.C.1 (CHA 8244-6). (*Quiet May.*)

PARTICLE SIZING

Fleming Instruments Ltd., Caxton Way, Stevenage, Herts. (Stevenage 3101-5).

PUMPS

Charles Austen Pumps Limited, Petersham Works, 100 Royston Road, Byfleet, Surrey (Byfleet 43224/5). (*Dymax small oil free diaphragm pumps.*)

RADIATORS

Dimplex Ltd., Millbrook, Southampton (Southampton 74425). (*Dimplex electric heating appliances.*)

Thomas Potterton Ltd., 20/30 Buckhold Road, London, S.W.18 (VAN 7202).

RADIANT HEATING

Harris Engineering Co. Ltd., York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19/20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103/105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8. Telex 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6. Telex 74621). (*Manufacturers of Industrial Space Heating and Air Cleaning Equipment.*)

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (01-459 1234). (*Gas Fires.*)

REFRIGERATION PLANT

John Bass Ltd., Fleming Way, Crawley, Sussex (Crawley 28765). ("*Bassaire*".)

M. L. Engineering (Plymouth) Ltd., 292 Leigh Road, Trading Estate, Slough, Bucks. (Slough 23838).

W. H. S. (Pathfinder) Ltd., Brockhampton Lane, Havant, Hampshire (Havant 3661. Cable Address: Pathfinder, Portsmouth). ("*Pathfinder*".)

RESEARCH AND DEVELOPMENT FACILITIES

The British Non-Ferrous Metals Research Association, Euston Street, London, N.W.1 (01-387 6411).

Head Wrightson Iron & Steel Works Eng. Ltd., Teesdale Iron Works, P.O. Box 10, Thornaby-on-Tees, Stockton-on-Tees, Co. Durham (Stockton-on-Tees 62241).

ROOM HEATERS, GAS

Cannon Industries Ltd., Deepfields, Bilston, Staffs. (Bilston 43161).
4 Old Park Lane, London, W.1 (HYDe Park 4861).

Radiation Gas Fires Ltd., Radiation House, North Circular Road, London, N.W.10 (01-459 1234). (*Gas Fires.*)

ROOM HEATERS, ELECTRIC

Dimplex Ltd., Millbrook, Southampton (Southampton 74425). (*Dimplex Electric Heating Appliances.*)

ROOM HEATERS, SOLID FUEL (OPEN FIRES AND OPENABLE FIRES)

Charles Lathe & Co. Ltd., Moat Foundry, Upper Church Lane, Tipton, Staffs. (Tipton 1887). ("*Claco*".)

Radiation Parkray Ltd., Radiation House, North Circular Road, London, N.W.10 (01-459 1234). (*Parkray Room Heaters.*)

SMOKE DENSITY GAUGES AND METERS

Photoelectronics (Arcall) Ltd., 92 Oldfields Road, Sutton, Surrey (Fairlands 4571).

Airflow Developments Ltd., Lancaster Road, High Wycombe, Bucks. (OHW4 25252).

SMOKE INDICATORS

Photoelectronics (Arcall) Ltd., 92 Oldfields Road, Sutton, Surrey (Fairlands 4571).

Radiovisor Parent Ltd., Stanhope Works, High Path, London, S.W.19 (Cherrywood (530) 3351).

Ronald Trist Controls Limited, Bath Road, Slough, Bucks. (Slough 25041). (*Electricon Smoke Density Indicators and Alarms.*)

STOKERS INDUSTRIAL

Babcock & Wilcox (Operations) Ltd., Babcock House, 209 Euston Road, London, N.W.1 (01-387 4321).
Rutland House, 148 Edmund Street, Birmingham, 3 (Central 6131).
Aylward House, Wine Street, Bristol, 1 (Bristol (C) 294561).
54 West Nile Street, Glasgow, C.1 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 8326).
Norfolk House, Grey Street, Newcastle-upon-Tyne (Newcastle 29212).

Crosthwaite Furnaces & Scriven Machine Tools Ltd., York Street Ironworks, Leeds, 9 (Leeds 32411/2). (*Forced draught furnaces.*)

Edwin Danks & Co. (Oldbury) Ltd., P.O. Box 4, Oldbury, Birmingham (Broadwell 2531).

Riley (IC) Products Ltd., 19 Woburn Place, London, W.C.1 (TERminus 2622).

John Thompson (Triumph) Ltd., Triumph Works, Kirkstall Road, Leeds, 3 (Leeds 34841).

STOVES, ANTHRACITE

A.P.L. Engineering Ltd., Polygon Works, Poyle Estate, Colnbrook, Bucks. (Colnbrook 2185). (*Manufacturers of Pithers Radiant Stoves.*)

VENTILATORS

W. G. Cannon & Sons Ltd., Carolyn House, Dingwall Road, Croydon, Surrey (Croydon 2201).
24 The Grove, Gosforth, Newcastle-upon-Tyne, 3 (Gosforth 53847).

Marshall & Parsons Ltd., 1111 London Road, Leigh-on-Sea, Essex (Southend 74867). (*Draught-Master.*)

Morgan Air Treatments Ltd., Darwin Street, Birmingham, 12 (Victoria 2096). ("*Morganair*".)

WARM AIR HEATING SYSTEMS

W. G. Cannon, & Sons Ltd., Carolyn House, Dingwall Road, Croydon, Surrey (Croydon 2201).
24 The Grove, Gosforth, Newcastle-upon-Tyne, 3 (Gosforth 53847).

Constant Air Systems Ltd., Raebarn House, Northolt Road, Harrow, Middx. (01-864 0288).
Wolverley House, Digbeth, Birmingham, 5 (021-643 5148).

Fan Application & Engineering Ltd., 76 Rivington Street, London, E.C.2 (01-739 9329).

Harris Engineering Co. Ltd., York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19/20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103/105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8. Telex 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6. Telex 74621). (*Manufacturers of Industrial Space Heating and Air Cleaning Equipment.*)

Morgan Air Treatments Ltd., Darwin Street, Birmingham, 12 (Victoria 2096). ("*Morganair*".)

Radiation Central Heating Ltd., Radiation House, North Circular Road, Willesden, London, N.W.10 (01-459 1234).

Wanson Company Ltd., 7 Elstree Way, Borehamwood, Herts. (01-953 7111. Telex 261169). (*Thermobloc Air Heaters; Thermobloc Oil or Gas-Fired Heating Systems.*)

WASTE FUEL BOILER PLANT

Cochran & Co. (Annan) Ltd., Annan, Dumfriesshire, Scotland (Annan 2111).
Leslie Court, 22-23 Strutton Ground, Westminster, London, S.W.1 (01-222 4441).
Wharton Road, Winsford, Cheshire (Winsford 2298).
5 St. Vincent Place, Glasgow, C.1 (Central 4929). (*Boilers, Industrial.*)

The Incinerator Co. Ltd., 14 Coopers Row, Tower Hill, London, E.C.3 (ROYal 9931, 5 lines). (*After burning units for furnaces of all types.*)

Longhurst Bros. & Beale Ltd., Polygon Works, Poyle Estate, Colnbrook, Bucks. (Colnbrook 2185). (*Impulsitor "Elite".*)

G. F. Rider (Process Plant) Ltd., Leeds Place Works, Tollington Park, London, N.4 (01-272 0404/5/6).

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G. F. Rider (Process Plant) Ltd., Leeds Place Works, Tollington Park, London, N.4 (01-272 0404/5/6).

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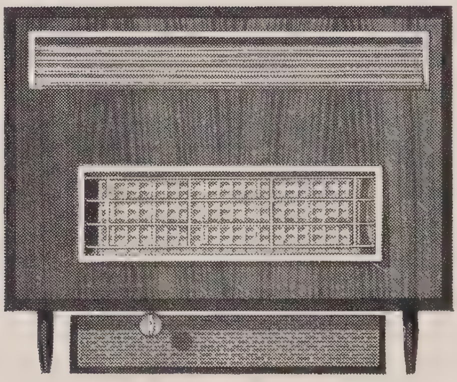

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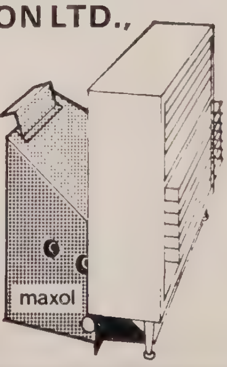

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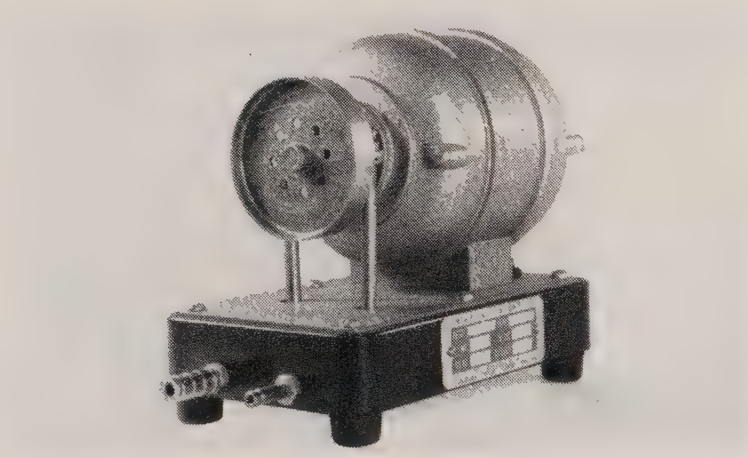

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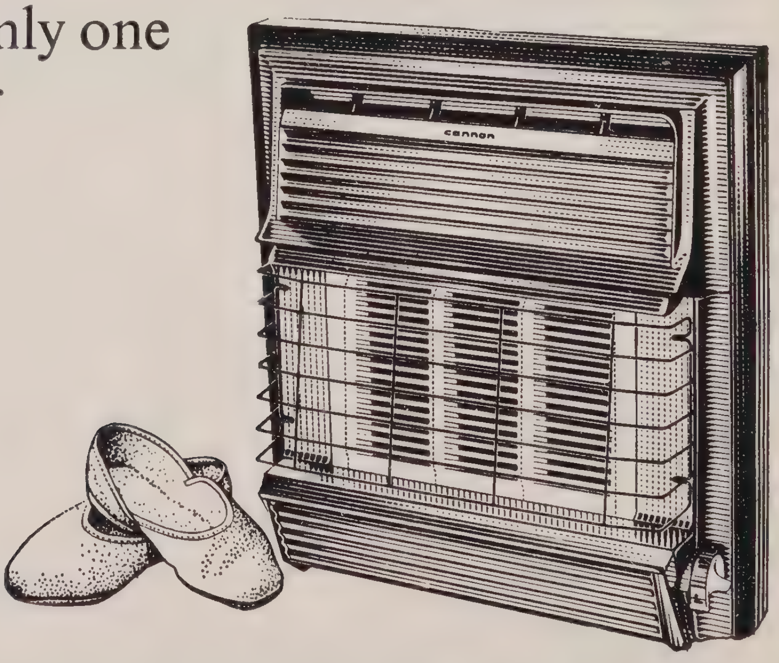

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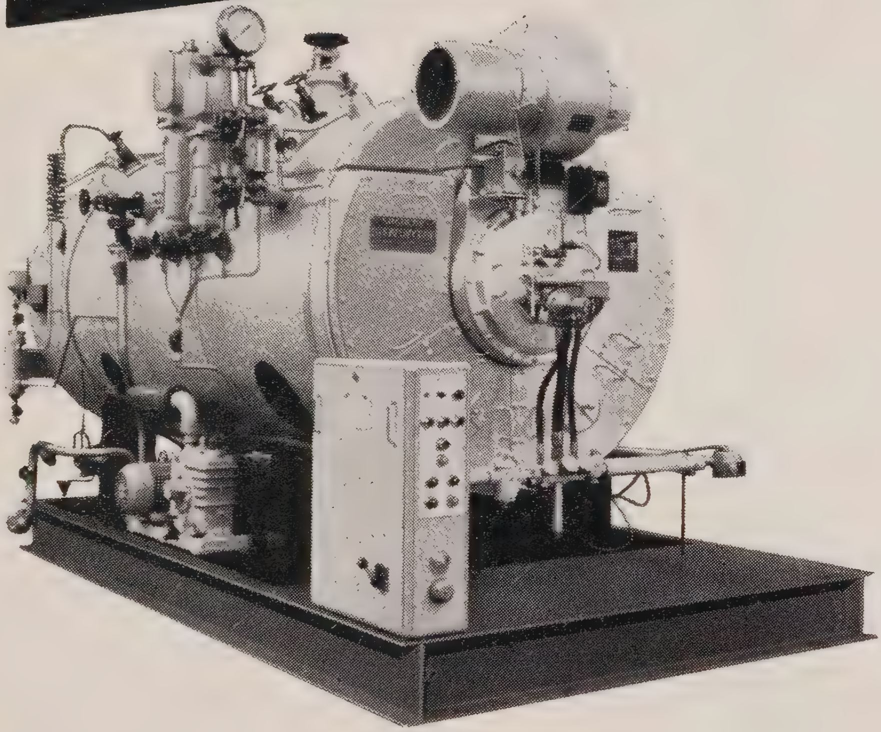

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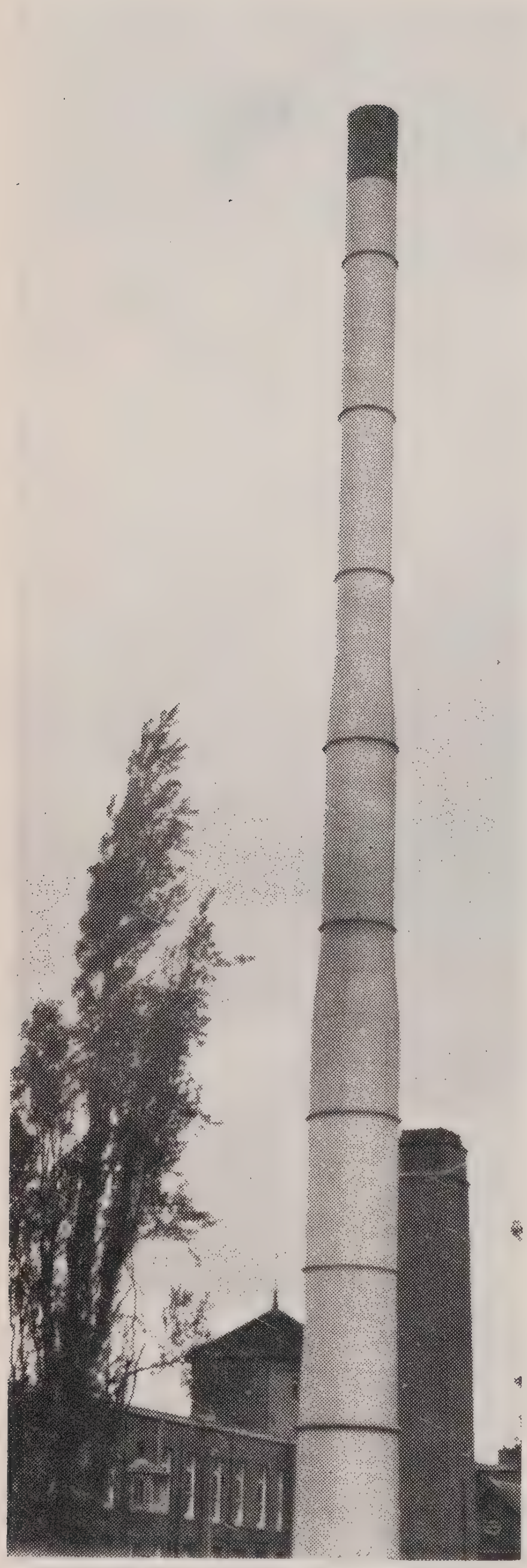

Photograph by courtesy of The King's College Hospital.

The *Beauvent Econoflu Steel Chimney

The illustration shows a 180 ft high x 6 ft minimum diameter *BEAUVENT ECONOFLU self-supporting mild steel chimney designed, manufactured and erected by F. E. BEAUMONT LTD. for THE KING'S COLLEGE HOSPITAL, Denmark Hill, London, S.E.5.

This chimney is fitted with a precast moler concrete lining 6 inches thick so arranged to divide the bore into three separate flues, two of these serve banks of steam boilers and the third serves an incinerator.

The precast moler concrete sections are 5 feet long and weigh over 2½ tons each. The steel chimney is novel in design inasmuch as the holding down bolts are within the shell of the chimney. This was necessitated owing to the very limited access and the narrow and obstructed road by which the chimney sections could be brought to the erection site. If the holding down bolt stools had been fitted externally to this chimney as is the normal practice, the overall width of the baseplate would have been 6 inches too wide to pass between two of the hospital buildings.

The steel chimney and lining weighed over 125 tons and it was completely erected in six days.

For further information please contact:

F. E. BEAUMONT LTD.,
465-483 Rathgar Road,
London, S.W.9.
Telephone: Brixton 4066
Telex: 25837

Midland Office:
28 Birmingham Street, Oldbury,
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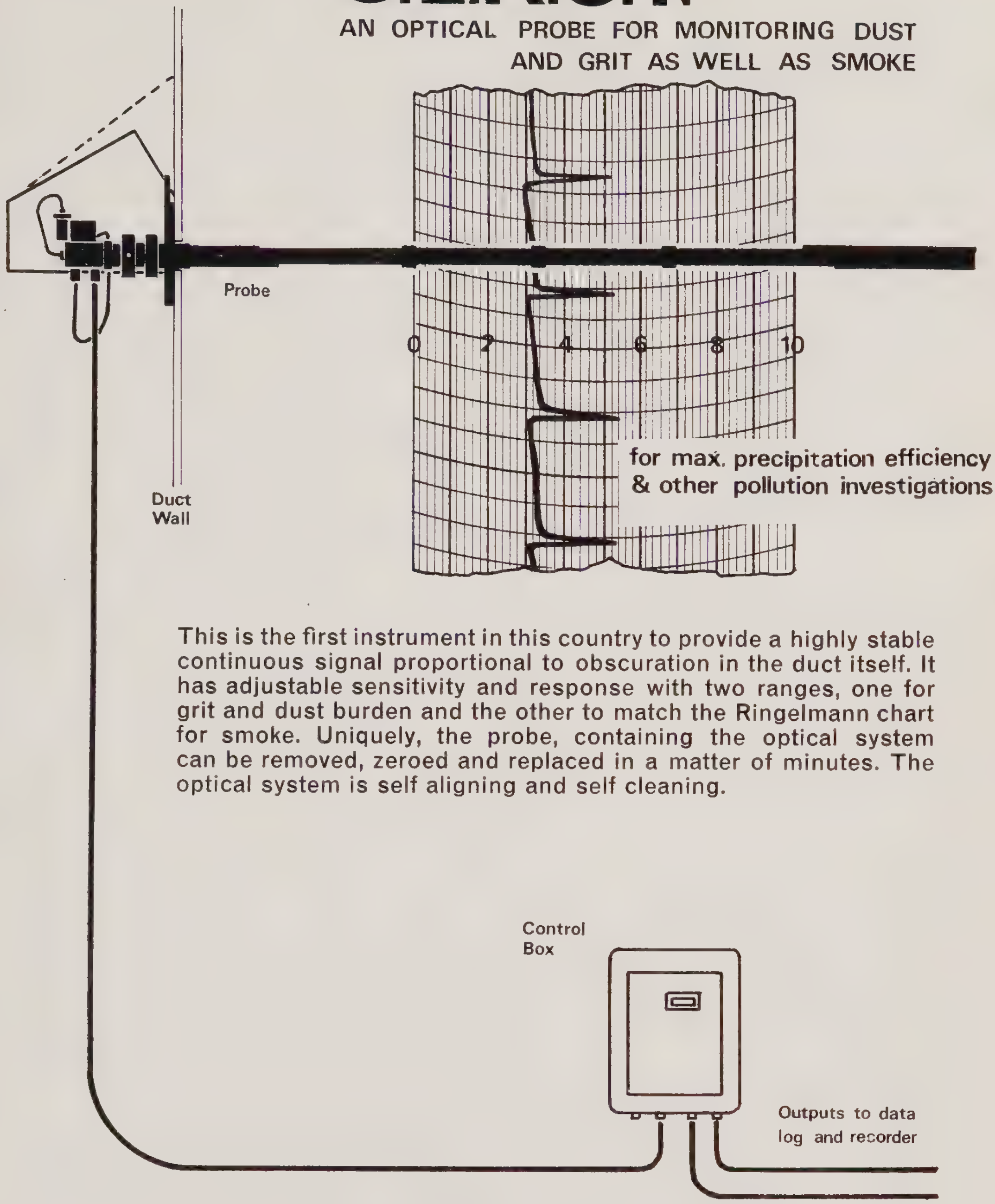

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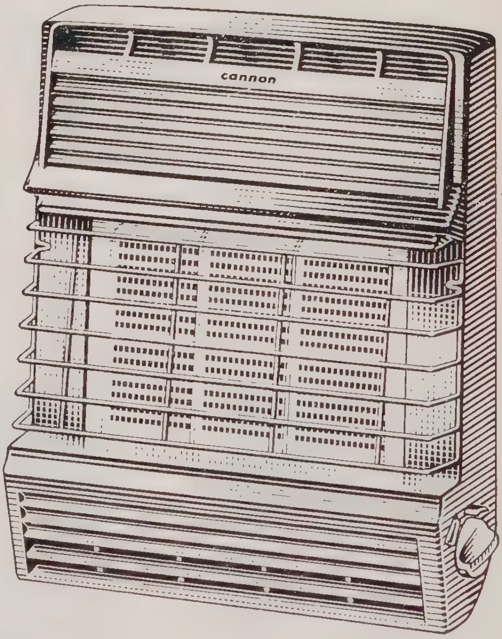

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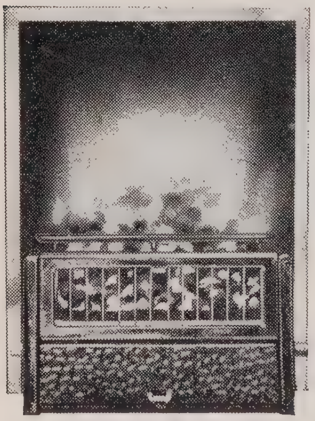

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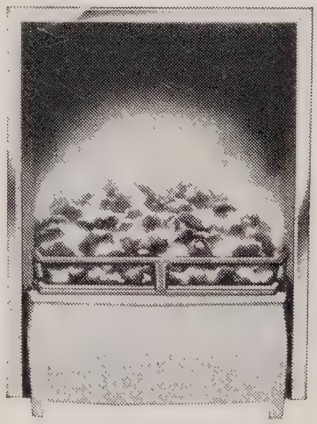

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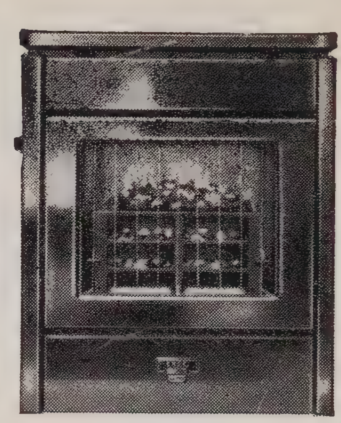

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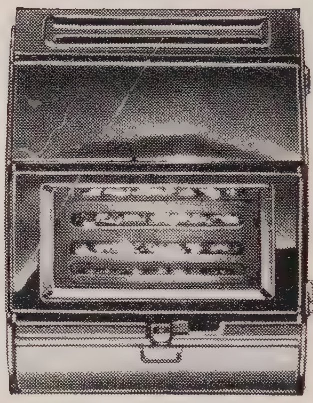

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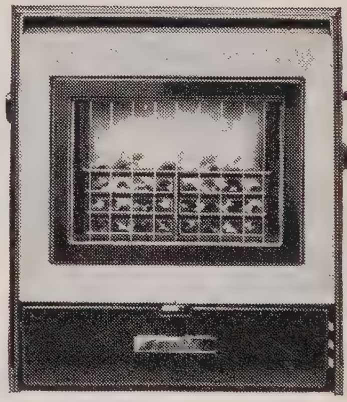

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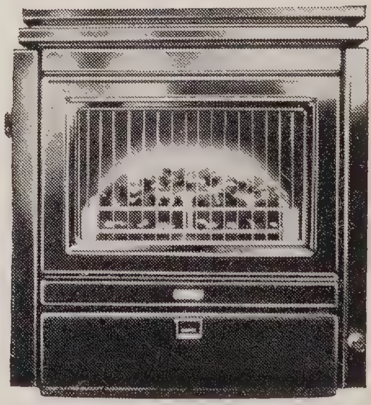

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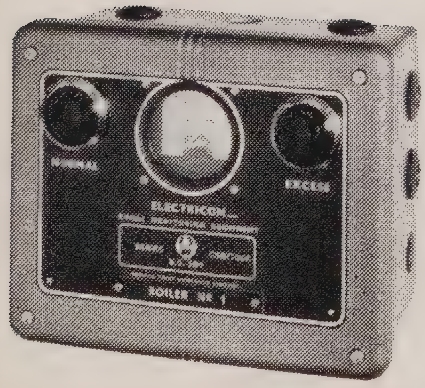

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The *Beauvent Econoflu Steel Chimney

The illustration shows a 180 ft high x 6 ft minimum diameter *BEAUVENT ECONOFLU self-supporting mild steel chimney designed, manufactured and erected by F. E. BEAUMONT LTD. for THE KING'S COLLEGE HOSPITAL, Denmark Hill, London, S.E.5.

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F. E. BEAUMONT LTD.,

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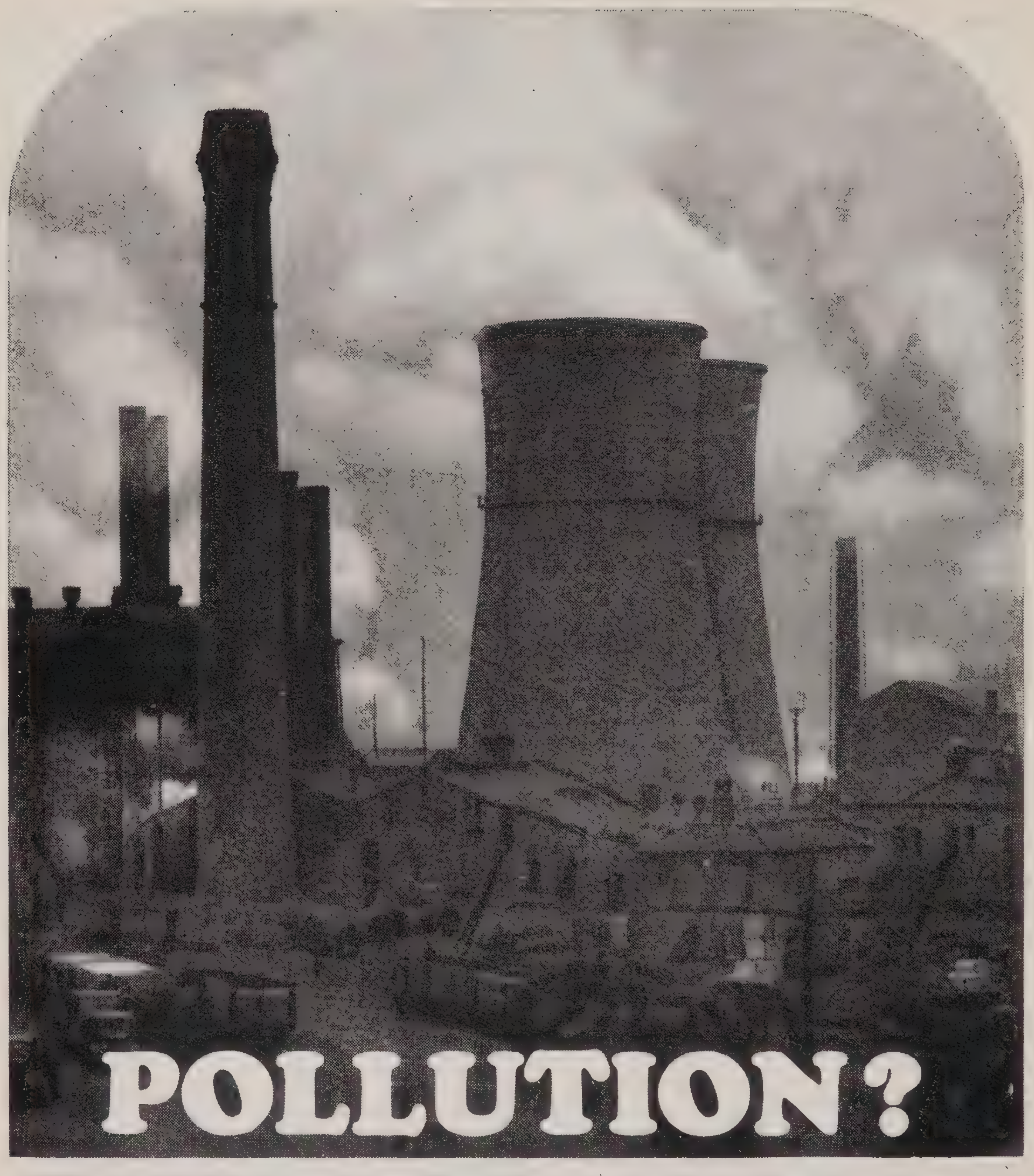

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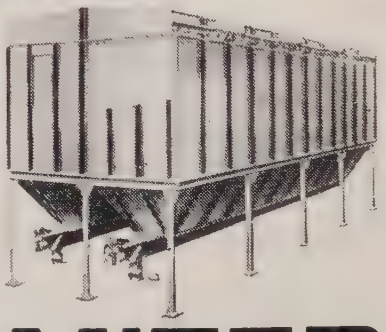

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CLEAN AIR YEAR BOOK
1968—1969

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The Cover Photograph—This photograph, reproduced by permission of The Ford Motor Co. Ltd., shows the pollution emitted from a cupola at Thames Foundry before being fitted with sophisticated fume, dust and grit removal equipment by Centri Spray Ltd. For pictures before and after fitting and details of the equipment now fitted, see the 1968 Summer Number of Smokeless Air.

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NATIONAL SOCIETY FOR CLEAN AIR
FIELD HOUSE, BREAMS BUILDINGS, LONDON, E.C.4
Telephone: 01-242 5038

CLEAN AIR EXHIBITION

Harrogate 22 — 25 October 1968

This exhibition held in conjunction with an annual conference, takes in all forms of domestic and industrial heating systems and their allied components, all types of equipment engaged in combating air pollution, the various fuels under fire, research and development progress, and many other varied manufactures related to these subjects which involve the **Clean Air Act.**

For further information write to:

The Exhibition Organiser
NATIONAL SOCIETY FOR CLEAN AIR
Field House, Breams Buildings
London, E.C.4. tel: 01-242 5038

CLEAN AIR PROGRESS

Review for 1967–8

THE most important feature of the year has been the efforts to secure a new Clean Air Act, to supplement, improve, and remove a few weaknesses in the Act of 1956. A private member's Bill was introduced by Mr. Robert Edwards, M.P., in May, 1967, and was given a second reading, but further progress was not made. Then, early in 1968, a new Bill was introduced by Mr. Robert Maxwell, M.P., with the advice and support of the Ministry of Housing and Local Government. To hope to achieve success this had to be reasonably short and non-contentious. It was given a second reading on 2 February, but since then there have been considerable delays in reaching the committee stage. There were first objections to a proposal that to save time the Bill should be considered by a committee of the whole House, instead of by one of the overloaded Standing Committees. When this was at last agreed there were further delays, and at the time of writing the committee stage had still not been reached. It is hoped however that at least a footnote reporting progress may be added before printing.

Another important legislative development was the publication in 1967 of the report of the Working Party of Grit and Dust Emission, which has been followed by the issue of regulations under section 7(2) of the Clean Air Act, 1956. The regulations came into operation on 1 May, 1968.

Pollution levels have continued to fall, both for smoke, or grit and dust, and for sulphur dioxide. Although the total emissions of sulphur dioxide continue to increase the ground level concentrations are generally being held or falling. The trends are very encouraging.

Smoke Control Area Progress

Despite the prevailing economic conditions there has been a further speed up of the rate of progress in establishing smoke control areas. The number of new smoke control areas (in operation, confirmed and submitted) during the year ended 31 March, 1968, was 355 compared with 207, 228 and 301 in each of the three preceding years. The present position on smoke control is shown in detail in the tables given in later pages. From these it will be seen that, to 31 March, 1968, the total number of premises covered by smoke control was 3,362,643, showing an increase over the twelve months of 487,113. It will also be seen that for England the percentage of the total "black areas" premises covered by smoke control was 44·95 at 31 March, 1968, compared with 39·56 per cent at 31 March, 1967. Greater London, with a figure of 67·98 per cent, maintains a long lead over the other regions.

Fuel Usage in the U.K.

Apart from the abolition of domestic smoke in smoke control areas, progress has continued to be made by the continual advance of central heating and by the growing use in the home of other means of smokeless methods, especially by electricity and gas. The prospects opened up by the development of North Sea gas are particularly encouraging for the acceleration it can bring towards clean air. There is still unfortunately difficulty in the full development of the new solid smokeless fuel processes, although the older, firmly established processes are continuing to expand. The accelerated run-down of the production of gas coke, or Gloco, because of the new gas-making processes and the advent of natural gas, is causing some concern in areas where smoke control has been largely based upon its use.

The Benefits of Clean Air

Although there is still a long way to go before the air of Britain can be said to be truly clean and pure, there have been many welcome indications of changes occurring because of the improvement in the quality of the atmosphere. These have been reported in *Smokeless Air*, and include the growing realization that the cleaning of buildings is at last worthwhile, and the return of various kinds of birds and of plants to hitherto smoky towns. A transformation is beginning and is being seen and appreciated.

Overseas

Many manifestations of increased concern and action over air pollution from countries in all parts of the world have been received (and reported in *Smokeless Air*) during the year. National clean air legislation has been enacted in Italy, Japan and Czechoslovakia, and there is a new Air Quality Act in the United States. In the United States there have also been further regulations to minimize pollution from road vehicles. The Netherlands, Sweden and Canada have issued reports or taken action of importance, and the Council of Europe, is considering a draft "Declaration of Principles" on co-ordinated and co-operative action prepared as a result of the recommendations of the Strasbourg Air Pollution Conference of 1964.

THE LAW RELATING TO AIR POLLUTION

The principal legislation in Great Britain (excluding Northern Ireland) is the Clean Air Act, 1956. This supersedes the Public Health (Smoke Abatement) Act, 1926, which in its turn amended the smoke abatement section of the Public Health Act, 1875. References to earlier legislation are given in the chronological history of air pollution on page 46.

Several amendments to the domestic (smoke control area) provisions of the Clean Air Act were included in the Housing Act, 1964. A note on these changes is given below.

A Clean Air (Northern Ireland) Act received the Royal Assent in 1964. Its provisions are largely identical with the 1956 Act.

Fumes and gases from industrial processes are controlled through the Alkali &c., Works Act, 1906, administered by the Alkali Inspectorate. Under the Clean Air Act smoke, dust and grit emission from certain scheduled processes are also the responsibility of the Inspectorate. (See the section, following, on the Alkali Act.)

Apart from the Clean Air Act it should be noted that action may be taken with regard to smoke or other nuisance from air pollution under common law procedure, and this can be used to secure both damages and an injunction.

In addition to a number of older Local Acts containing smoke abatement provisions, over 50 local authorities obtained powers, between 1946 and 1956, for the establishment of smokeless zones and/or the optional prior approval of new industrial fuel-burning installations. Local authorities may continue to use these provisions unless the relevant sections of their Acts should be repealed, as may be done under section 35 of the Clean Air Act. A number of local authorities have also established smokeless housing estates, where smokelessness is ensured not by legislation but by conditions of tenancy.

Pollution from road vehicles is not controlled under any of the clean air legislation, but through the Road Traffic Act and Regulations, a description of which is given on a following page.

The Clean Air Act in Outline

For a fuller digest of the contents of the Act reference may be made to the *Summary of the Clean Air Act*, published by the Society. The following outline necessarily omits much detail of importance.

SS.1 and 2 deal with **Dark Smoke,** defined as shade No. 2 of the Ringelmann scale. Regulations have been issued on the extent to which dark smoke is permitted. It is an offence to emit dark smoke beyond these limits, and the only defences that may be used are specified: lighting up from a cold furnace; unavoidable failure of plant; unavoidable use of unsuitable fuel; and a combination of any of these. For seven years (from 5th July, 1956) there was a further defence that it was not possible to complete necessary alterations to plant.

(Stat. Inst. 1958. No. 498). (Scotland: Stat. Inst. 1958. No. 1933 (S.106)).

S.3 requires all **New Furnaces,** other than domestic (i.e. less than 55,000 B.Th.U. per hour) to be as smokeless as practicable. Local authorities *must* be notified of new installations and *may* be asked to give prior approval.

S.4 relates to regulations for the installation of **Smoke Density Recorders,** etc.

SS.5 to 9 require all furnaces to use means to minimize **Grit and Dust from Furnaces:** large *new* furnaces (burning more than 1 ton per hour) and all new pulverized fuel furnaces of any size to secure prior approval of grit arresting equipment to be installed; regulations for measuring and recording grit and dust; supplying local authorities with information about such records; and putting outdoor furnaces on the same footing as those in buildings.

S.10, **Height of Chimneys,** gives powers to local authorities to reject plans for new buildings if chimneys are not sufficiently high.

SS.11 to 15 concern **Smoke Control Areas,** which may be established by local authorities under an Order requiring Ministerial approval. Smoke control areas may be entirely smokeless (as with smokeless zones) or may make certain exemptions or impose special conditions. For domestic (and charitable, etc.) premises local authorities may make a grant towards the cost of converting grates, etc., to appliances suitable for smokeless use. The authority may recover part of the grant from the central Exchequer, and normally the cost of conversion will be owner or occupier and local authority 30 per cent each, Exchequer, 40 per cent.

In a case of smoke emission in a control area it is a defence if an authorized fuel only was being burned. Regulations defining authorized fuels have been issued.

(Stat. Inst. 1956, No. 2023).

(The Housing Act, 1964, S.95, amends certain provisions of the above sections).

S.16 deals with **Smoke Nuisances** from smoke other than dark smoke. In this case it is an offence only when a nuisance to inhabitants of the neighbourhood has been proved.

S.17 concerns *processes* that are scheduled as **Special Cases** by Ministerial regulation, and in which the control of pollution will be by the Alkali Inspectorate and not the local authorities. The processes include those that are or will be registered under the Alkali Act. With respect to smoke, grit and dust the Minister may transfer control of particular *premises*, or part of them, to a local authority.

(Stat. Inst. 1958, No. 497). (Scotland: Stat. Inst. 1958, No. 1932 (S.105).)

S.18 on **Colliery Spoilbanks,** requires the owner of a coal or shale mine or quarry to use all practicable means to prevent the combustion of deposited refuse, and to minimize any smoke or fumes that may occur.

S.19 is to the effect that **Railway Engines** are subject to dark smoke emission control as if they were buildings. The owner of the engine must also use any practicable means there may be to minimize smoke emission.

S.20 is to the effect that dark smoke from **Vessels** in specified waters shall be controlled as such smoke from buildings. This applies to vessels in any water not navigable to a sea-going ship and in other defined waters.

(Stat. Inst. 1958, No. 878). (Scotland: Stat. Inst. 1958, No. 1934 (S.107).)

S.21 gives a local authority power of **Exemption** from action under the Act, for a stated period, for research or investigations relevant to the problem of air pollution.

S.22 requires a local authority to report smoke emissions from **Crown Premises** to the Minister responsible for the premises. He must then inquire into the case and if there is cause for complaint must use all practicable means to prevent or minimize the emission or abate the nuisance.

S.23 provides for the setting up of a **Clear Air Council,** with the Minister of Housing, Local Government and Welsh Affairs as its Chairman, to review progress and obtain advice on air pollution matters. There is also a similar Clean Air Council for Scotland.

(Stat. Inst. 1957, No. 766).

S.24 states that **Building Byelaws** "may require the provision in new buildings of such arrangements for heating or cooking as are calculated to prevent as far as practicable the emission of smoke." (A model byelaw for this purpose has now been issued but is being revised to meet the provisions of the Housing Act, 1964).

S.25 gives local authorities power to undertake or contribute towards the cost of **Research and Publicity,** etc.

S.26 relates to the improper **Disclosure of Information** obtained as a result of administering the Act.

S.27. **Penalties.** In summary, and in each case quoting the maximum penalty: *Dark Smoke,* private dwellings, £10; other cases, £100 for each offence (e.g. each day). *New furnaces not smokeless:* £10. *Smoke emission in control areas:* £10 for each offence. *Disclosure of Information:* £100 or 3 months imprisonment, or both. *Other offences:* £100.

S.28 relates to **Authorization of Works.**

S.29 on **Enforcement,** refers to the powers of local authorities.

S.30 on **Notification of Offences** is procedural.

SS.31, 32 and 33 deal with administrative and legal matters.

S.34 on **Interpretation,** gives the meaning to be applied to a number of words and phrases used in the Act.

S.35 deals with **Repeals and Transitions.**

S.36 excludes **Northern Ireland** from the provisions of the Act.

S.37 gives the **Short Title** and commencement of the Act.

The First Schedule relates to the confirmation and coming into operation of orders of local authorities under section 11.

The Second Schedule consists of amendments to the Alkali &c., Works Regulation Act, 1906.

The Third Schedule gives modifications of, and provisions supplementary to, Public Health Acts, etc.

The Fourth Schedule lists the enactments repealed by the new Act.

The Housing Act, 1964

The Clean Air Act, 1956, was amended in respect to dwellings (sections 11 to 15) by section 95 of the Housing Act, 1964. This section is divided into nine subsections, which may be summarized as follows:

(1) A new dwelling is defined as one begun on or after 16 August, 1964. (2) and (3) Local authorities may designate as unsuitable, appliances for which suitable fuels are not fully available in the area. (4) and (5) give local authorities discretionary powers in relation to payment of grants in certain special cases. (6) (7) and (8) provide for the extra cost of discretionary in case of hardship, etc., to be shared between the local authority and the Exchequer. (9) provides for grant to be paid for means for the ignition of solid fuels even if "works" are not involved, which was not previously the case.

For a full description and commentary on these amendments reference should be made to the Ministry of Housing circular No. 46/64.

Clean Air Act Regulations

Authorized Fuels

The Smoke Control Areas (Authorized Fuels) Regulations came into force on 31st December, 1956. These relate to section II of the Clean Air Act, which provides for a defence in the case of smoke emission from a building in a smoke control area if it is proved that the smoke "was not caused by the use of any fuel other than an authorized fuel." The fuels authorized in the regulations are: anthracite, briquetted fuels carbonized in the process of manufacture, coke, electricity, gas, low temperature carbonization fuels and low volatile steam coals.

Liquid Fuels

The Building Regulations described below do not include appliances for the use of liquid fuels, nor do the Authorized Fuel Regulations include liquid fuel as an authorized fuel. The Smoke Control Areas (Exempted Fireplaces) Order, 1957, exempts from control under section 11 of the Clean Air Act fireplaces designed or adapted for the combustion of liquid fuel, "provided they are so installed, maintained and operated as to minimize the emission of smoke." Under section II the Minister may make Orders exempting from control in smoke control areas any fireplace that he is satisfied can be used without producing any substantial quantity of smoke when burning other than an authorized fuel. The Order therefore allows for the use of oil-burning appliances in smoke control areas, and also has the effect of allowing such appliances to be included among those permitted under the Building Regulations.

It should be noted that although the use of oil is thus permitted in smoke control areas and under the Building Regulations, oil remains a non-authorized fuel, so that in case of smoke emission from an oil-burning installation in a smoke control area the authorized fuel defence could not be used.

Mechanical Stokers

The Smoke Control Areas (Exempted Fireplaces) Order, 1959, exempts mechanical stokers from smoke control area orders in the following terms: "Fireplaces, other than fireplaces fired by pulverized fuel, constructed on or after the 31st day of December, 1956, and equipped with mechanical stokers, or adapted on or after that date for use with such stokers," on condition that "the fireplace shall be so installed, maintained and operated as to minimize the emission of smoke. No fuel shall be used other than that for which the mechanical stoker was designed."

Appliances

The Exempted Fireplaces Order, 1959, also exempts two specified appliances: the Solid Fuel Ductair Unit, manufactured by Radiation Ltd., and the Fulgora Slow Combustion Stove, manufactured by Fulgora Stoves, Ltd., on condition that they "shall be so installed, maintained and operated as to minimize the emission of smoke, and in any case in accordance with the manufacturers' instructions." In the case of the Fulgora Stove it is also a condition that "no fuel shall be used other than wood waste in clean condition." A new, 1966, Order exempts the Hounsell Sawdust Burning Stove with similar conditions.

Firelighting by Sticks and Paper

Circular 28/60 of the Ministry of Housing and Local Government states that while gas remains the best and most convenient means of lighting solid smokeless fuels in smoke control areas, there will be houses which cannot be supplied with gas at a reasonable cost and also some people may object to having gas at all. For the present, therefore, the Minister accepts that the small amount of smoke caused in this way must be accepted in the general interest of making progress with the creation of smoke control areas.

" The Minister thinks that legal cover for the use of sticks and paper for lighting fires can best be given by the use in smoke control orders of the power of exemption in section 11(3) of the Clean Air Act, 1956. Local authorities could give an exemption in general terms extending to fireplaces in any building or separately occupied parts of a building which is not supplied with town gas; or alternatively, they could give a specific exemption to named individual premises. Either type of exemption should be subject to a condition to secure that it would have effect only where authorized fuels or kindling sticks and paper were being used ".

The Minister asks that such exemption should be included where it is apparent that some buildings or parts of buildings will remain without a gas supply. He also asks that if a local authority should decide not to include an exemption along these lines in such a case, then they should give an explanation when submitting the order for confirmation.

Building Regulations

Prevention of Smoke Emission

The Building Regulations, 1965, include a section, M2, relating to the prevention of emission of smoke. This supersedes the earlier byelaw on the subject. The full text of the section is:

M2. In any building (other than a building erected under former control) there shall not be installed for the purposes of heating or cooking in that or any other building any appliance which discharges the products of combustion into the atmosphere, unless that appliance is designed to burn as fuel either gas, coke, or anthracite:

Provided that nothing in this regulation shall prohibit the installation of:

(i) a furnace which complies with Section 3 of the Clean Air Act 1956; or

(ii) any appliance of a class exempted conditionally or unconditionally from the provisions of Section 11 of the Clean Air Act 1956 (which relates to smoke control areas) by any order for the time being in force under subsection (4) of that section; or

(iii) a solid fuel appliance with a bottom grate unsuitable for burning coke or anthracite but designed so as to be capable of use with an alternative bottom grate which is suitable for burning such fuel.

Dark Smoke Regulations

In Statutory Instrument 1958, No. 498, " The Dark Smoke (Permitted Periods) Regulations, 1958," the Minister of Housing and Local Government has made the regulations required for the operation of Section 1 (2) of the Clean Air Act. The Regulations permit the following:

(i) Not more than 10 minutes dark smoke emission in the aggregate from any chimney in any period of 8 hours.

(ii) This permitted time extended to 14 minutes if soot blowing is carried out within the 8 hour period.

(iii) The 10 and 14 minutes to be extended for chimneys serving more than one furnace as follows:
A chimney serving 2 furnaces, 18 and 25 minutes respectively; a chimney serving 3 furnaces, 24 and 34 minutes respectively; a chimney serving 4 or more furnaces, 29 and 41 minutes respectively.

(iv) A continuous emission of dark smoke from the chimneys of factories (other than that caused by sootblowing) for a period not exceeding 4 minutes.

(v) The emission of black smoke up to 2 minutes in the aggregate in any period of 30 minutes.

The regulations apply to dark smoke from the chimneys of factories, shops, offices and railway engines, but not to dark smoke from the funnels of ships, for which separate regulations have been made, as set out below.

Dark Smoke (Permitted Periods) (Vessels) Regulations

These regulations, under s.1(2) of the Clean Air Act, are contained in Statutory Instrument 1958, No. 878. They specify the periods within which dark smoke is permitted from vessels in various classes of case, as detailed in the schedule below. The phrases in italics, "10 minutes in 2 hours", etc., mean that 10 minutes emission of dark smoke *in the aggregate* is permitted in any period of 2 hours.

Schedule—Classes of Case

1. Emissions from a forced draught oil-fired boiler furnace, or an oil engine. 10 *minutes in* 2 *hours.*

2. Emissions from a natural draught oil-fired boiler furnace (except in the cases falling within class 4 below). 10 *minutes in* 1 *hour.*

3. Emissions from a coal-fired boiler furnace:
   (*a*) when the vessel is not under way (except in the cases falling within class 4 below). 10 *minutes in* 1 *hour.*
   (*b*) when the vessel is under way. 20 *minutes in* 1 *hour.*

4. Emissions from a natural draught oil-fired boiler furnace or a coal-fired boiler furnace in the following cases:
   (*a*) a vessel with funnels shortened for the purpose of navigating the Manchester Ship Canal;
   (*b*) a tug not under way, but preparing to get under way or supplying power to other vessels or to shore installations;
   (*c*) a vessel not under way but using main power for the purpose of dredging, lifting, pumping or performing some other special operation for which the vessel is designed. 20 *minutes in* 1 *hour.*

5. Emissions from any other source. 5 *minutes in* 1 *hour.*

In addition, *continuous* dark smoke caused otherwise than by the soot-blowing of a water-tube boiler, shall not exceed:

(1) in the case of classes 1 and 2 above, 4 *minutes.*

(2) in the case of natural draught oil-fired boiler furnaces in class 4, 10 *minutes.*

Further, in *no case* shall black smoke (Ringelmann 4) be emitted for more than 3 *minutes* in the aggregate in any period of 30 *minutes.*

The Alkali, etc., Works Regulation Act

The Alkali, etc., Works Regulation Act, 1906, consolidates and extends previous similar Acts, the first of which was passed in 1863.

The Act includes a schedule of chemical processes and a list of noxious or offensive gases. Since 1906, this schedule and list have been extended by Statutory Orders made under the Public Health (Smoke Abatement) Act, 1926 and the Alkali, etc., Works Regulation (Scotland) Act, 1951. Such orders were made in 1928, 1935, 1939, 1950, 1958, 1961, 1963 and 1966.

The essence of the Act lies in the requirements that (1) scheduled processes must be registered annually, (2) as a prior condition in the case of a first registration the scheduled process must be provided to the satisfaction of the Chief Inspector with the " best practicable means " for preventing the escape of noxious or offensive gases to the atmosphere and for rendering such gases harmless and inoffensive, (3) the " best practicable means " must thereafter be maintained in good and efficient working order and must be operated continuously, (4) in the case of certain processes, upper limits are specified for the concentration of total acidity in effluent gases which may be discharged to the atmosphere.

Provision is made for the setting up and maintenance of an inspectorate to administer the Act, and regulations are included relating to the registration and inspection of works, general procedure, penalties, etc. The Chief Inspectors are required to make an Annual Report to be laid before Parliament, relating to the work of the inspectorate.

Under the Clean Air Act, 1956, the provisions of the Alkali Act are extended to apply to smoke, dust and grit from premises controlled under the Act as they already do to noxious or offensive gases. Thus from 31st December, 1956 virtually all forms of air pollution from processes registered under the Alkali Act will be subject to control under that Act by the Alkali Inspectorate. Any other parts of a work are the responsibility of the local authority.

The Alkali, etc., Works Orders

The first four Orders dealt mainly with processes in the heavy chemical and related industries where noxious or offensive gases are the potential offenders. In an Order which came into operation on 1 June 1958 the Minister of Housing and Local Government further extended the Alkali Act by adding to the list of scheduled processes a number which are responsible principally for emissions of smoke, grit and dust. Among these processes are a number for the production of iron and steel, iron or steel melting processes, and some copper and aluminium processes. Gas and coke works, electricity works, coal fired producer gas plant and lime kilns and certain ceramic kilns fired by coal or oil were also added to the list together with sulphate reduction and caustic soda plant and certain types of chemical incinerators. The Order also made the appropriate additions to the list of noxious or offensive gases.

The 1961 Order deals with emissions from the processing of uranium, beryllium, selenium and their compounds. The 1963 Order is much more comprehensive and was prepared largely to take into account the major changes which have taken place in recent years in the heavy chemical and allied industries. It also covers the burning of scrap cable to remove the insulation. This is necessary because of the increasing amount of cable covered with polyvinyl-chloride, which, on burning, gives rise to hydrochloric acid, chlorides and possibly phosgene. The Order begins the policy of descheduling certain of the 1958 Order smoke processes.

The 1966 Order is important, for in addition to making a few minor alterations to the lists of scheduled works and noxious or offensive gases, it revokes all the earlier seven Orders and consolidates them in the 1966 Order. Thus, all the Alkali Acts and Orders since 1863 are consolidated in the 1906 Act and the 1966 Order.

Chimney Height

The effects of air pollution are proportionate to the concentration of the pollutants, and where pollution is unavoidable (which includes the products of combustion from any fuel, and in particular the gases from sulphur-bearing fuels) it is desirable to secure the greatest dispersion possible. Apart from the Alkali Act, which requires that emitted noxious and offensive gases shall be rendered harmless and inoffensive, the only legislation to promote the dispersion of chimney gases is Section 10 of the Clean Air Act, 1956. This controls the height of chimneys, other than those of residences, shops and offices. Plans submitted in accordance with building byelaws which show that it is proposed to erect a chimney, may be rejected unless the local authority is satisfied that the chimney will be of a height "sufficient to prevent so far as practicable the smoke grit dust and gases from becoming prejudicial to health or a nuisance".

The Act gives no definition of sufficient height, which depends on the circumstances of each case. Use has been made of various formulae for determining the required height. These formulae are of some complexity and more recently a simpler form of guide has been issued by the Ministry of Housing and Local Government. (Memorandum on Chimney Heights, H.M.S.O., 1963, 1s. 3d. net. Reprints of the nomograms on Permatrace are available from H.M.S.O. at a cost of 10s.)

The calculations required first take account of the amount of sulphur dioxide emitted per hour, and assume that the efflux velocity of the flue gases will not be less than that indicated for different types of installation. The guide then shows how the "uncorrected chimney height" may be calculated. This is the height appropriate for the relevant maximum rate of SO_2 emission when account has been taken of the neighbouring sources of pollution, the local background level of pollution, and the general character of the district. The uncorrected height is never less than 40 feet.

A key of five different types of district is given and by the use of nomograms the uncorrected chimney height for very small, small, medium and large installations is read off. If the uncorrected chimney height thus determined is not less than 2½ times the height of the building to which the chimney is attached, or any other building in the immediate vicinity, no further correction need be made. If however the uncorrected height is less than 2½ times the height of such buildings, a further correction has to be made. This correction is partly based on the ratio between the greatest length and height of the building (to the ridge), since this influences the effect of down-draughts.

On a further nomogram a line is taken from the uncorrected chimney height through a point representing the building height to a reference line. From here another line is drawn through a point representing the height of the building or its greatest length, whichever is lower, to a point indicating the final height. This is subject to any adjustment that may be necessary to ensure that the chimney top is never less than 10 feet above the ridge of the building, nor less than the uncorrected height.

The Working Party on Chimney Heights has been reconvened primarily to have another look at its advice to the Minister so far as it relates to very small installations, with a view to modifying the Memorandum. Difficulty has been experienced in its application to this class of furnaces. At the same time the opportunity is being taken to review the remainder of the Memorandum.

Grant Arrangements

A circular of the Ministry of Housing and Local Government (51/65) of June 1965 introduced important modifications to the grant arrangements in smoke control areas following the changes made in Circular 69/63. This followed the report on domestic fuel supplies and permitted grants to be made on openable stoves or room-heaters, and equivalent appliances using other fuels. Difficulties arise in the interpretation of what is "reasonably necessary" and are said to have involved both the local authorities and the department in a great deal of correspondence.

This circular has now been amended by Circular No. 25/66 to take account of new appliances, increases in costs and developments in the testing of electric storage heaters.

The circular lists the cost limits for various types of appliances. 19 items are listed as an appendix, and as they are of especial general interest the list is quoted in full below.

It is for the local authority to decide, within the appropriate cost level, what costs are reasonable in each case. The Minister will accept as qualifying for Exchequer contribution expenditure which is acceptable to the local authority and which falls within the limits shown in this list, but he will not normally accept any portion of the cost (excluding installation cost) which exceeds the stated limit.

It is pointed out that it remains a principle that facilities of a standard approximately equal to that of existing facilities should be provided, but that extra costs should not be incurred solely to provide higher standards. It is pointed out that the installation of a modern smokeless appliance in place of a coal-burning fireplace may incidentally provide a higher standard of heating, but that this will not preclude grant on the full payment.

A number of other matters are referred to, and a further appendix revises paragraph 26 of the Ministry's Memorandum on Smoke Control Areas, in which reference is made to the changes arising from S.95 of the Housing Act, 1965.

Road Traffic Pollution Law

The Statutory Regulations governing the emission of smoke or other forms of pollution from road vehicles are made by the Minister of Transport and Civil

Smoke Control Area Grants; Cost Limits for Various Appliances (Circular 25/66)

	£
Improved open fire (including integral gas ignition and, where necessary, deepening plate and bar)	6
Improved open fire (including integral gas ignition and, where necessary, deepening plate and bar) with boiler	17*
Underfloor draught fire and fan-assisted open fire	17
Underfloor draught fire and fan-assisted open fire with boiler	23*
Solid fuel room heater	26
Solid fuel room heater with boiler	36*
Gas room heater	24
Electric thermal storage heater	29
Oil room heater	16
Solid fuel cooker with boiler	60
Gas or electric cooker	35
Independent solid fuel boiler, **including installation**	25
Gas water heater (e.g. gas circulator and back boiler unit), **including installation**	25
Electric immersion water heater, **including installation**	15
Wash boiler, gas and electric	13
Gas poker, including flex and tap	2
Bottled gas igniter, if gas container is hired	3
Bottled gas igniter, including purchase of gas container	6
Electric kindler	8

* £2 may be added where
(i) it would be impossible or inadvisable to connect the existing boiler to the new space-heating appliance,
and
(ii) either
(*a*) the existing boiler is itself bower-barffed or made of stainless steel, copper, aluminium, bronze or other superior material,
or
(*b*) one of the above types is necessary to comply with local water bye-laws.

Aviation in exercise of the powers conferred on him by sections 3, 17, 30, and 111 of the Road Traffic Act, 1930 (20 & 21 Geo.5.c.43.).

The Regulations at present operative are known as "The Motor Vehicles (Construction and Use) Regulations 1966. (Statutory Instruments 1963, No. 1646)." Under Part IIA. of the Regulations, governing the construction, weight and equipment of vehicles, Regulation 22 (Emission of smoke or vapour), states: "Every motor vehicle shall be so constructed that no avoidable smoke or visible vapour is emitted therefrom."

Regulation 23(1) includes compression ignition (i.e., diesel) engines in the words "motor vehicles", and (2) requires excess fuel devices to be so fitted that they cannot be operated by a person while he is being carried by the vehicle, unless (a) such a device cannot be used after the engine has been started, or (b) does not cause any increase in smoke or visible vapour.

Part III of the Regulations governs the Use of Vehicles. Regulation 83 states:

"No person shall use or cause or permit to be used on a road any motor vehicle from which any smoke, visible vapour, grit, sparks, ashes, cinders, or oily substance is emitted if the emission thereof causes or is likely to cause damage to any property of injury to any person who is actually at the time or who reasonably may be expected on the road, or is likely to cause danger to any such person as aforesaid".

Regulation 84 relates to the use of the excess fuel device, and requires such a device to be so maintained that it does not cause the engine to be supplied with excess fuel while the vehicle is in motion on a road; nor allows any person so to use it.

(*The operation of the regulations, by Ministry of Transport officers, and by the Police, is discussed, together with the technical factors involved, in a paper by H. D. Fawell, Ministry of Transport, published in the NSCA Harrogate Conference,* 1964, *Proceedings.*)

The Clean Air (Measurement of Grit and Dust) Regulations 1968

These Regulations came into force on 1 May, 1968. They enable local authorities to require the making and recording of measurements of grit and dust emitted from a furnace or oven covered by Section 7(1) of the Clean Air Act of 1956, the provision of the necessary apparatus and the supply to the local authority of the results of the measurements. The Ministry of Housing and Local Government suggest that when local authorities examine plans for furnaces or chimneys for the purposes of Section 6(1) and 10(1) of the Act, they should consider whether they are likely to make a direction under Section 7 in respect of the furnace or oven concerned, and whether they should advise the firm to incorporate appropriate sampling points in the course of construction.

Clean Air Bill, 1968

At the time of going to press, the new Clean Air Bill has been read a third time and it is hoped that it will shortly become law. Full details of the Act will be given in the issue of "*Smokeless Air*" published immediately after enactment, and a summary of the provisions of the Act will be included in this Section of the next Clean Air Year Book.

Warren Spring

The Work of the Warren Spring Laboratory of the Ministry of Technology on the Investigation of Air Pollution and its Abatement

Warren Spring Laboratory carries out research on the nature and extent of air pollution, and on its prevention and abatement, in order to provide technical information necessary for the administration of clean air legislation, for town planning and the location of industry, and for research into the effects of air pollution.

The National Survey of Air Pollution

The National Survey, devised by Warren Spring Laboratory, is planned statistically to enable valid conclusions to be drawn on the incidence of air pollution in urban areas throughout the country, while restricting observations to a reasonably small number of sites. Some 120 towns were chosen for the purpose and each agreed to make daily measurements of smoke and sulphur dioxide in the following five types of district, in so far as examples are to be found in each town:

(*a*) Residential area with a high population density, such as old terrace housing.
(*b*) Residential area with a low population density, such as a housing estate or suburb.
(*c*) Industrial area.
(*d*) Commercial area, with central heating predominating.
(*e*) Smoke control area, which may be any of the above types.

Observations are also being made at a number of sites in the depth of the country to give background information. All sites for the survey were chosen by the local authority in collaboration with Warren Spring Laboratory, and on 1 April, 1968, observations for this statistically-planned part of the Survey were being made by 119 authorities operating 411 instruments and a further 33 authorities in the area administered by the Greater London Council operating 192 instruments.

In addition, a further total of 245 local authorities and others were making daily observations of smoke and sulphur dioxide at 573 sites. These measurements are being made on the initiative of the authorities concerned, and primarily for their own local purposes, but they form a second part of the National Survey and comparison of these results with the national averages established by the first part of the survey will be of great value.

Under part three of the Survey a further 107 sites were operated by 52 authorities in rural areas, to provide data on drift of pollution and background information.

Other Measurements of Air Pollution

In addition to the daily smoke and sulphur dioxide observations, many local authorities and other bodies make monthly measurements of grit-and-dust-fall, using the British Standard Deposit Gauge, and of the rate of reaction of sulphur compounds with lead dioxide. Warren Spring Laboratory continues to give advice and help in connection with such measurements.

Standing Conference of Co-operating Bodies

All local authorities and other organizations who make measurements of air pollution, either as part of the National Survey or purely for their own local purposes, and who submit the data regularly to Warren Spring Laboratory for publication, are entitled to send representatives to the Standing Conference of Co-operating Bodies. This Conference meets twice yearly to discuss matters of interest connected with air pollution. Other bodies may do so on payment of a subscription. At 31 March, 1968, 435 bodies had appointed representatives to the Conference.

Publication of Results

All data submitted to the Laboratory are collated, and summaries are published. The section which deals with daily measurements of smoke and sulphur dioxide is published monthly and that dealing with measurements made with the deposit gauge and the lead dioxide instrument is published at six-monthly intervals. Annual Summaries of the data are also published.

Abstracts of papers and other information on air pollution are also published monthly.

These Summaries and Abstracts are available on request to all concerned with problems of air pollution.

In addition, a series of Reports on the Investigation of Atmospheric Pollution published by H.M. Stationery Office, gives analyses of these results and an account of research on the measurement and abatement of air pollution.

The last in this series, the 32nd Report, brings the position up to date to 1966, and gives, in addition, an account of the changes in the administrative arrangements.

Instruments

Work by the Laboratory on the calibration of the daily smoke filter and on the accuracy of the daily hydrogen peroxide method for sulphur dioxide has now led to British Standard Specifications on both methods and to their acceptance internationally by the Organization for Economic Co-operation and Development (OECD). Effort is now concentrated on the development of a reasonably cheap automatic SO_2-recorder.

Town Planning Studies

In the past few years it has become increasingly apparent that while it is quite impracticable to control the amounts of sulphur oxides in the air by limiting their emission (as is done for smoke under the Clean Air Act) it is, nevertheless, possible to make great improvements by taking full advantage of natural dispersion processes. This can be done by the proper design of chimneys in relation to buildings and the proper siting of the various types of residential district in relation to each other and to industrial installations. A great deal of effort is being devoted to obtaining sufficient knowledge of the distribution and spread of pollution in urban areas to enable town planners to do their work satisfactorily from an air pollution point of view.

While the National Survey provides a great deal of information on the distribution of pollution in urban areas this is being supplemented by special investigations. Thus a survey in Sheffield is being undertaken in co-operation with the Department of Geography of the University to examine the build-up and dispersion of pollution over the city. The effects of topography, weather conditions, and relation of industry to housing are being examined.

A great deal of advice on the siting and heights of chimneys is given both to local authorities and to firms. Often advice is difficult unless the results of tests made on a model in a wind-tunnel are available. A suitable tunnel is now being designed so that these tests can be undertaken. The tunnel will also be used to obtain more basic information on dispersion from chimneys.

Motor Vehicle Exhausts

Carbon monoxide is the major pollutant emitted by petrol-engined vehicles and high concentrations of it have been recorded in cities. Measurements of carbon monoxide are being made continuously at one site in each of six towns for a period of one year so that the extent of pollution can be assessed.

Removal of Sulphur Compounds from Flue gas

While it is recognized that it would be impracticable, economically and technically, to contemplate the universal application of methods of removing sulphur compounds from flue gas, it is considered that if a suitable process were available it might have limited but important applications. Work is now in progress on the possibility of abating the nuisance from one particularly troublesome type of emission.

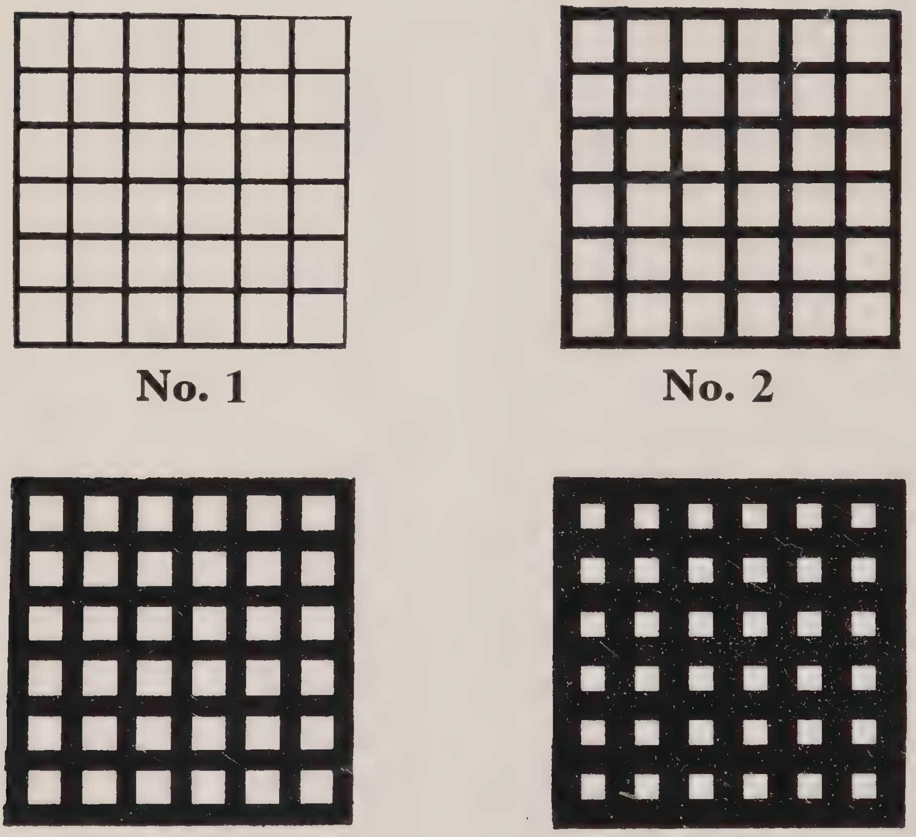
The National Industrial Fuel Efficiency Service

The National Industrial Fuel Efficiency Service, formed in May, 1954, is a non-profit organization which offers industry, local authorities and commercial property owners practical help in the use of heat and power, whatever type of fuel is used.

N.I.F.E.S. services include Heat and Power Surveys, which show by precise measurement where waste occurs in factory premises and how it can be prevented. This service is also used in plant extension or development projects. Boiler house efficiency tests and methods of increasing the efficiency of steam-raising plant. Advice on improving the efficiency of heat-using process plant, furnaces and power plants. Regular service, designed to bring a factory or premises to a high degree of efficiency in the use of fuel and to maintain it at that level. Checks on space-heating systems and advice on insulation. Advice on the Clean Air Act requirements and the reduction of smoke and grit emission. N.I.F.E.S. uses equipment specially designed by the British Coal Utilization Research Association as a basis for advice in grit emission cases. It is also used to test the operation and efficiency of grit arrestors which, under the Clean Air Act, are required to be properly maintained and used. A comprehensive series of training and refresher courses for boiler plant operators, works and plant engineers, and all those whose work is connected with fuel and steam-using plant. For the benefit of those who are unable to attend technical colleges, N.I.F.E.S. has a specially designed study course (arranged in conjunction with the College of Fuel Technology) leading to the City and Guilds of London Boiler Operator's Certificate.

All enquiries should be addressed to the appropriate Area Engineer at the address given in the Directory.

The Ringelmann Chart



No. 1 **No. 2**

No. 3 **No. 4**

The Ringelmann chart, by means of which dark smoke is defined in the Clean Air Act, consists of the above four shades, which when viewed from a sufficient distance appear as varying tones of grey. They show 20, 40, 60, and 80 per cent blackness. The charts are 4 in. square, and are viewed, in line with the smoke being observed, at about 50 ft. from the observer. A full specification for production and use is given in B.S. 2742C. The standard chart is published in Britain by Charles Griffin & Co. Ltd., 42 Drury Lane, London, W.C.2. A pocket-size facsimile the "Microringelmann" is published by the U.S. journal "Power" (McGraw-Hill). Copies of both charts may be purchased from the Society. (See Guide to Publications, following, for prices.)

To the far-sighted, a time to act!

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Estimates of Air Pollution in Great Britain in 1966

Tables prepared by Dr. Albert Parker, C.B.E.

(1) From the Main Uses of Fuel

Figures in millions of tons to the nearest 0·1m. tons for quantities of fuel, and of grit and dust, and to the nearest 0·01m. tons for smoke and sulphur dioxide.

Fuel and Class of Consumer	*Quantity of Fuel*	*Pollutants Discharged*		
		Smoke	*Grit and Dust*	*Sulphur Dioxide*
Coal				
Domestic (including miners' coal)	25·5	0·83	0·1	0·65
Electricity works	67·9	small	0·3	2·02
Railways	1·7	0·03	small	0·05
Industrial and miscellaneous	36·0	0·11	0·2(*a*)	1·04
Coke ovens	24·3	small	small	0·09
Gas works	16·7	small	small	0·12
	172·1			
Coke (excluding consumption in gas works and blast furnaces)				
Domestic, including other manufactured solid smokeless fuels	6·4	nil	small	0·14
Industrial and miscellaneous	6·2	nil	small	0·15
	—	0·97	0·6	4·26
Oil				
Domestic				
Kerosene and domestic fuel oils	2·2	very small	nil	0·01
Industrial				
Kerosene, gas/diesel and fuel oils, and creosote-pitch	39·4(*b*)	small	nil	1·89
Road and Rail Transport				
Motor spirit, gas/diesel and fuel oils	16·3	small	nil	0·08
Marine Craft				
Gas/diesel and fuel oils	1·1	small	nil	0·04
	59·0(*c*)	small	nil	2·02
Total for coal and oil	—	0·97	0·6	6·28

(*a*) Excluding grit and dust emission, estimated at about 0·4m. tons, from industrial processes other than steam raising.

(*b*) The amount of 39·4m. tons of oil is equivalent in heating value to about 67m. tons of coal, which if used for the same purposes would have produced about 0·2m. tons of smoke, 0·2m. tons of grit and dust, and about 1·9m. tons of sulphur dioxide.

(*c*) The amount of 59·0m. tons of oil is equivalent to about 100m. tons of coal, so that the coal equivalent of the coal and oil consumed (excluding air transport) in Great Britain in 1966 was about 272m. tons. In addition there were used nuclear electricity, hydro-electricity, and natural gas together equivalent to about 11m. tons of coal.

The estimates of pollution from road vehicles in the following table were made by Dr. Parker on the basis of the most recent analyses of the exhaust gases with the engines operating under various conditions.

(2) From Road Vehicles

Consumption of Motor Spirit	11·322m. tons
Consumption of Derv Fuel	4·041m. tons

Pollutant	*Quantity in Million Tons from* *Petrol Engines*	*Diesel Engines*
Carbon monoxide	5·3	0·08
Hydrocarbons	0·26	0·016
Aldehydes	0·01	0·003
Oxides of nitrogen	0·18	0·05
Sulphur dioxide	0·02	0·03

The estimated quantity of carbon monoxide discharged into the air from the other industrial and domestic uses of all fuels in 1966 is about 11 million tons of which nearly five million was from domestic heating appliances.

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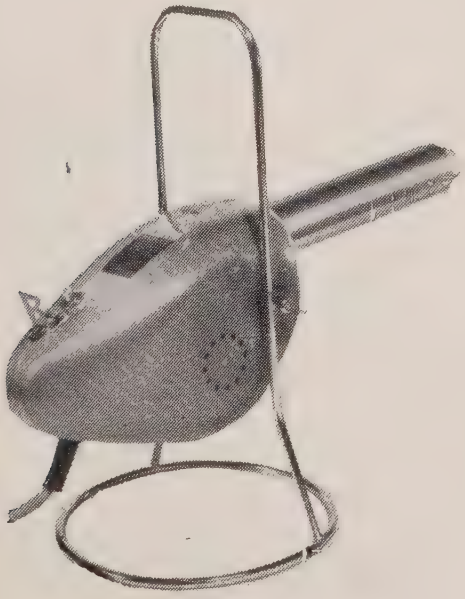

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SMOKE CONTROL AREAS

Programmes and Progress

The following lists contain the names of Local Authorities in the "Black Areas" with (1) the target date for completion of their Smoke Control Programme, (2) the final acreage, (3) acreage in operation on April 1, 1968, (4) total number of premises in operation on April 1, 1968.

The figures have been compiled as accurately as possible from the records of the Ministry of Housing and Local Government, from "Smoke Control 1962-1966" and from information received by the Society directly from many Local Authorities regarding target dates. Where no figures are given in columns 1 and 2, this means that the Authority in question has not submitted a programme to the Minister of Housing and Local Government.

The figures in italics refer to acres and premises in smokeless zones established by some Local Authorities before the Clean Air Act and in areas where smoke control operates through tenancy agreements.

NORTHERN

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.) 1.4.68*	*4* *Premises (In Oper.) 1.4.68*
Tyneside and Wearside				
Gateshead C.B.	1980	4,677	448	3,256
Newcastle C.B.	1980	11,401	4,556	19,205
South Shields C.B.	1980	—	19	512
Sunderland C.B.	1980	9,013	1,440	20,313
Tynemouth C.B.	1987	5,000	571	2,259
Jarrow B.	1975	1,500	172	1,522
Wallsend B.	1975	3,544	1,173	4,069
Blaydon U.D.	—	—	291	735
Boldon U.D.	1977	—	107	1,091
Felling U.D.	1976	—	425	2,813
Gosforth U.D.	1970	—	—	—
Hebburn U.D.	1974	1,563	994	2,646
Longbenton U.D.	—	—	465	6,024
Newburn U.D.	1980	4,648	630	2,940
Ryton U.D.	—	—	—	—
Whickham U.D.	1977	6,213	773	3,230
Teeside				
Darlington C.B.	—	—	—	—
*Middlesbrough C.B.	—	—	3,283	16,038
Hartlepool C.B.	1975	6,584	382	2,133
*Stockton-on-Tees B.	—	6,084	—	—
*Thornaby-on-Tees B.	1971	1,993	1,208	2,133
Billingham U.D.	1971	2,092	2,718	6,688
Eston U.D.	1972	3,000	35	494

* These authorities form a part of the new *Teeside C.B.*

YORKSHIRE

West Riding (North)				
Bradford C.B.	1971/2	25,503	12,559 *1,481*	42,802 *14,284*
Dewsbury C.B.	1975	6,720	567	3,842
Halifax C.B.	1977	14,081	2,512	13,272

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.) 1.4.68*	*4* *Premises (In Oper.) 1.4.68*
West Riding (North) (continued)				
Huddersfield C.B.	1980	14,147	3,391	12,448
Leeds C.B.	1975	40,613	13,207	45,815
Wakefield C.B.	1977	5,800	1,230	2,950
Batley B.	1977	4,461	968	2,852
Brighouse B.	1975	7,875	2,413	4,952
Castleford B.	—	—	34	507
Keighley B.	1970	3,238	4,222	12,648
Morley B.	1977	9,994	3,593	4,192
Ossett B.	1968	3,332	2,133	4,955
Pontefract B.	1982	4,865	987	1,991
Pudsey B.	1980	5,205	398	2,037
Spenborough B.	1972/3	8,600	2,264	6,165
Aireborough U.D.	1970	6,856	4,212	7,093
Baildon U.D.	1970	2,830	1,699	3,706
Bingley U.D.	1970	11,018	4,309	7,936
Denholme U.D.	—	—	—	—
Elland U.D.	1974	5,951	857	1,334
Featherstone U.D.	—	—	—	—
Heckmondwike U.D.	1972	697	454	1,734
Horbory U.D.	1971	1,280	533	1,841
Horsforth U.D.	1970	2,706	1,157	4,231
Knottingley U.D.	1969	2,837	678	3,002
Mirfield U.D.	1979	—	623	1,860
Normanton U.D.	1979	3,061	56	152
Queensbury and Shelf U.D.	1975	2,795	524	1,086
Rothwell U.D.	1974	10,695	973	2,058
Shipley U.D.	1970	2,184	1,685	7,813
Sowerby Bridge U.D.	1973	4,000	561	2,040
Stanley U.D.	—	5,169	1,308	664
West Riding (South)				
Barnsley C.B.	—	7,811	414	954
Doncaster C.B.	1975	8,371	2,612	9,567
Rotherham C.B.	1973	8,000	1,333	6,078
Sheffield C.B.	1972	39,598	18,325	70,386
Connisborough U.D.	1983	—	—	—
Cudworth U.D.	1975	1,746	—	—
Darfield U.D.	—	—	—	—
Darton U.D.	1972	4,718	256	473
Dearne U.D.	1987	—	208	1,250
Dodworth U.D.	—	—	—	—
Hoyland Nether U.D.	—	—	—	—
Mexborough U.D.	1975	—	—	—
Rawmarsh U.D.	—	—	—	—
Royston U.D.	—	—	—	—
Swinton U.D.	1980	—	153	1,326
Wath-upon-Dearne U.D.	1972	2,665	823	1,443
Wombwell U.D.	—	—	—	—
Worsborough U.D.	1976	1,660	—	—
Rotherham R.D.	—	—	—	—
East Riding				
Kingston-upon-Hull C.B.	1971	12,000	4,848	27,682

NORTH WESTERN

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.) 1.4.68*	*4* *Premises (In Oper.) 1.4.68*
South Lancashire and North-East Cheshire				
Bolton C.B.	1972	5,401	1,839	15,120
			86	*1,050*
Bury C.B.	1971	2,168	1,038	3,900
Manchester C.B.	1970	27,255	12,008	69,680
			523	*4,764*
Oldham C.B.	1981	6,392	2,076	9,404
Rochdale C.B.	1972	9,556	5,615	16,377
			67	*337*
Salford C.B.	1970	5,202	2,257	20,305
			57	*1,859*
Stockport C.B.	1975	8,439	1,190	10,122
Wigan C.B.	1975	5,083	1,256	3,074
Altrincham B.	1973	3,519	45	547
Ashton-under-Lyne B.	1976	4,146	1,346	6,272
Dukinfield B.	—	1,725	1,284	1,776
Eccles B.	1970	3,417	2,247	5,210
Farnworth B.	1978	1,504	200	940
Heywood B.	1970	8,342	2,599	5,812
Hyde B.	1975	4,170	1,982	6,944
Leigh B.	1971	6,359	666	4,117
Middleton B.	1981	5,170	1,275	8,253
Mossley B.	1970	1,200	54	541
Prestwich B.	—	2,420	2,337	3,525
Radcliffe B.	—	4,915	527	1,374
Sale B.	1972	3,628	2,556	11,042
Stalybridge B.	1975	3,030	591	2,824
Stretford B.	1970	3,530	1,714	11,258
Swinton and Pendlebury B.	1978	3,363	749	3,787
Abram U.D.	—	—	—	—
Aspull U.D.	—	—	—	—
Atherton U.D.	1974	2,289	1,318	2,028
Audenshaw U.D.	1973	1,241	659	1,047
Blackrod U.D.	—	—	—	—
Bredbury and Romily U.D.	1977	688	566	2,126
Chadderton U.D.	1969	3,013	2,121	7,112
Cheadle and Gatley U.D.	1968	5,285	4,846	15,525
Crompton U.D.	1975	2,865	419	1,316
Denton U.D.	1969	2,592	1,907	11,244
Droylesden U.D.	1974	1,245	842	4,451
Failsworth U.D.	1975	1,663	356	3,093
Golborne U.D.	1975	5,765	—	—
Hindley U.D.	1979	2,612	225	999
Horwich U.D.	—	—	—	—
Ince in Makerfield U.D.	—	—	—	—
Irlam U.D.	1974	4,717	748	2,541
Kearsley U.D.	1980	1,720	11	84
Lees U.D.	—	—	—	—
Little Lever U.D.	—	808	—	—
Royton U.D.	1973	2,149	635	1,421
Tottington U.D.	—	2,544	—	—
Tyldesley U.D.	1980	5,174	—	—
Urmston U.D.	1972	3,944	1,410	5,591
Westhoughton U.D.	1980	5,834	183	861

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.) 1.4.68*	*4* *Premises (In Oper.) 1.4.68*
South Lancashire and North-East Cheshire (continued)				
Whitefield U.D.	1968	3,386	3,209	4,565
Worsley U.D.	1973	7,240	1,036	4,686
Central Lancashire				
Blackburn C.B.	1978	8,088	712	5,963
Burnley C.B.	1971	4,695	1,516	11,515
Preston C.B.	1975	6,357	2,141	15,807
			176	*1,918*
Accrington B.	1975/80	4,418	57	657
Colne B.	1976	817	184	2,035
Darwen B.	1980	—	400	1,000
Nelson B.	1972	—	283	1,891
Barrowford U.D.	1975	—	—	—
Brierfield U.D.	1974	—	75	248
Church U.D.	1980	528	226	997
Clayton-le-Moors U.D.	—	1,060	—	—
Fulwood U.D.	1977	3,164	180	705
Great Harwood U.D.	1975	—	—	—
Oswaldtwistle U.D.	—	—	—	—
Padiham U.D.	1973	976	523	1,674
Rishton U.D.	1987	1,087	—	—
Merseyside				
Birkenhead C.B.	1979	8,043	3,045	8,607
Bootle C.B.	1975	3,054	1,109	6,131
Liverpool C.B.	1972	27,818	13,293	68,738
St. Helens C.B.	1975	8,865	853	4,153
Wallasey C.B.	—	5,961	4,834	21,242
Warrington C.B.	1972	4,639	2,181	9,215
Bebington B.	1980	2,220	1,013	6,487
Ellesmere Port B.	1977	3,724	1,160	6,333
Widnes B.	1975	4,500	2,394	5,657
Ashton-in-Makerfield U.D.	—	—	—	—
Haydock U.D.	—	—	—	—
Huyton-with-Roby U.D.	1970	3,054	953	3,645
Kirkby U.D.	1965	—	1,947	10,938
Litherland U.D.	—	1,180	326	215
Newton-le-Willows U.D.	1978	2,800	152	1,068
Prescot U.D.	1976	748	124	1,152
Runcorn U.D.	1970	3,116	941	3,401
MIDLANDS				
Derby, Nottingham and Chesterfield				
Derby C.B.	1977	8,000	1,215	9,382
Nottingham C.B.	1975	18,364	5,281	15,182
			125	*2,000*
Chesterfield B.	1975	8,472	1,202	4,943
Ilkeston B.	1980	3,017	552	1,910
Mansfield B.	1980	7,009	955	2,229
Alfreton U.D.	—	5,023	—	—
Arnold U.D.	1981	—	86	377
Beeston and Stapleford U.D.	1974	6,468	3,980	10,207

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.) 1.4.68*	4 *Premises (In Oper.) 1.4.68*
Derby, Nottingham and Chesterfield (continued)				
Bolsover U.D.	—	4,326	86	167
Carlton U.D.	1975	4,018	173	1,257
Dronfield U.D.	1975	4,567	428	3,700
Eastwood U.D.	—	—	—	—
Hucknall U.D.	—	4,029	474	421
Kirby-in-Ashfield U.D.	—	—	—	—
Long Eaton U.D.	1980	3,559	24	254
			57	*750*
Mansfield Woodhouse U.D.	1988	—	—	—
Staveley U.D.	1976	6,504	—	—
Sutton-in-Ashfield U.D.	1982	165	947	2,571
West Bridgford U.D.	—	3,045	—	—
Basford R.D.	—	—	—	—
Chesterfield R.D.	1972	29,000	3,956	8,151
North Midlands				
Leicester C.B.	1975	16,990	7,703	35,611
West Midlands				
Birmingham C.B.	1974	51,147	7,988	55,382
			203	*1,387*
Coventry C.B.	—	19,171	5,321	18,924
			30	*232*
Dudley C.B.	1980	13,151	4,886	22,682
Walsall C.B.	1980	8,777	1,203	2,829
Warley C.B.	—	5,804	837	6,142
West Bromwich C.B.	1987	10,298	889	11,222
Wolverhampton C.B.	1986	—	3,978	16,408
Halesowen B.	1971	5,247	2,263	5,948
Nuneaton B.	1978	11,767	2,896	4,037
Solihull B.	1989	13,645	3,412	6,046
Stourbridge B.	1975	4,000	1,225	4,827
Sutton Coldfield B.	1979	13,978	1,015	4,423
Aldridge—Brownhills U.D.	—	9,284	974	8,822
Bedworth U.D.	—	—	830	880
Coseley U.D.	—	—	—	—
Darlaston U.D.	—	—	52	512
Willenhall U.D.	1972	2,834	417	3,049
Potteries				
Stoke-on-Trent C.B.	1975	21,209	6,394	10,805
Newcastle-under-Lyne B.	1980	8,882	2,783	6,596
Kidsgrove U.D.	1979/80	4,095	75	735
SOUTH WEST				
Bristol				
Bristol C.B.	1980	26,345	5,051	18,105
LONDON				
Greater London Boroughs				
City of London (completed)	1955	677	677	21,700
Barking	—	8,449	5,616	41,728
Barnet	1976	22,124	9,012	50,345
Bexley	1975	14,986	4,377	12,817

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.) 1.4.68*	*4* *Premises (In Oper.) 1.4.68*
Greater London Boroughs (continued)				
Brent	1971	10,924	5,634	41,675
Bromley	1977	39,293	6,077	32,624
Camden	1968	5,365	4,157	77,519
Croydon	1975	23,812	4,027	33,363
Ealing	1971	13,708	8,204	60,103
Enfield	1970	20,060	13,800	51,890
Greenwich	1970	11,724	7,692	51,049
Hackney (completed)	1967	4,812	4,812	90,507
Hammersmith (completed)	1967	3,988	3,988	72,559
Haringey	1968	7,490	6,787	87,396
Harrow	1975	12,555	3,181	22,351
Havering	1974	29,110	7,948	37,037
Hillingdon	1976	27,259	11,025	29,096
Hounslow	1970	14,469	8,418	35,676
Islington	1969	3,679	2,169	57,937
Kensington and Chelsea (Royal)	1971	2,952	2,055	54,435
Kingston-upon-Thames (Royal)	1978	9,279	2,655	15,033
Lambeth	1976	6,738	2,383	44,642
Lewisham	1968	8,581	7,821	81,969
Merton	1975	9,379	4,885	26,623
Newham	1978	8,986	1,272	10,428
Redbridge	1970	3,947	9,039	46,195
Richmond-upon-Thames	1970	13,645	10,546	47,456
Southwark	1975	7,117	3,895	50,658
Sutton	1975	10,729	3,333	22,087
Tower Hamlets	1968	4,876	4,592	63,570
Waltham Forest	1975	9,804	5,375	37,579
Wandsworth	1970	8,628	5,018	47,045
Westminster (City)	1968	5,333	4,755	110,248
Outer London				
Dartford	—	—	254	2,123
Epsom and Ewell	—	—	—	—

SCOTLAND

Total Acreage and Premises in Operation at 1.4.68

	Acreage	*Premises*		*Acreage*	*Premises*
Barrhead	384	2,779	Hamilton	212	2,260
Clydebank	1,204	5,421	Kilmarnock	77	290
Coatbridge	1,239	5,050	Lanark County	1,328	7,247
Dumbarton	1,244	5,042	Midlothian County	1,070	1,278
Dundee	4,981	24,323	Milngavie	281	16
East Kilbride	4,714	15,621	Motherwell	759	4,880
Edinburgh	7,086	25,600	Paisley	3,279	13,085
Falkirk	1,961	4,842	Renfrew Burgh	668	2,341
Fife County	300	2,877	Rutherglen	639	4,350
Galashiels	690	1,598	Stirling County	2,024	6,170
Glasgow	18,877	130,068	West Lothian	2,384	15
Grangemouth	381	2,192			

WALES

Total Acreage and Premises in Operation at 1.4.68

	Acreage	*Premises*		*Acreage*	*Premises*
Connah's Quay U.D.	53	—	Pontypridd	8,141	12,717
Mold U.D. (Nos. 1 & 2)	137	381		(By arrangement, only low volatile coal to be sold in the area)	
Newport C.B.	43	651			
Wrexham U.D. (Nos. 1 & 2)	277	1,375			

Solid Smokeless Fuels

All solid smokeless fuels are manufactured for specific purposes for use in blast furnaces, foundry cupolas and for the domestic market. The fuels vary according to the type of coal from which they are made and the method of carbonization. Certain of the domestic fuels are manufactured to a British Standard Specification and are carefully graded in size to ensure their suitability for a wide range of domestic appliances.

The authorized solid smokeless fuels are as follows:

Anthracite

Anthracite is obtained mainly from South Wales and is characterized by its hard and bright appearance and is distinguished by its high carbon and low volatile content.

It is a suitable fuel for roomheaters, boilers and cookers in which it will burn for many hours without attention. The small sizes of Anthracite, peas, beans or grains, are used on gravity feed boilers.

Low Volatile Steam Coal

There are two categories of Low Volatile Steam Coal:

(a) Welsh Dry Steam Coal, which differs only slightly from Anthracite from visual inspection. It has a relatively high carbon content although its volatile content is slightly higher than Anthracite. It is suitable for use in roomheaters, boilers and cookers.

(b) A low volatile coal with a slightly higher volatile content than the Welsh Dry Steam Coal is suitable for use in open fires. It has a high bulk density and the replenishment of the fire need not be so frequent as with lighter fuels. This fuel known as Lovol is mainly available in South Wales and the West of England.

Phurnacite

Phurnacite is carbonized ovoids made from specially selected and prepared Welsh Dry Steam Coals. Most of the Volatile content is removed during the manufacturing process. The resulting smokeless ovoids burn for long periods without attention, are completely free of stone or shale and are suitable for use in roomheaters, boilers and cookers.

The ovoids are extremely hard so that breakage and the formation of "fines" during transit is unlikely.

BurnBrite

This fuel is manufactured in coke ovens from specially selected prepared coal at a lower temperature and for a shorter period than other products from coke ovens and is suitable for the improved open fire. Smaller sizes can be burned in roomheaters, boilers and cookers.

BurnBrite is available in London, the Midlands, North Western, South Yorkshire and Northern Areas and parts of Scotland.

Cleanglow and Phimax

These fuels are produced by different area gas boards in continuous vertical retorts from specially selected coals. Cleanglow is available in most parts of the country though Phimax is only available in the North West.

Cleanglow and Phimax are suitable for use on the open fire, are easy to ignite and burn with a flame.

Coalite and Rexco

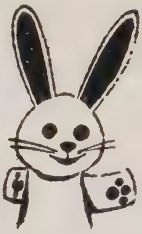
Coalite and Rexco are manufactured from two different low temperature carbonization processes. They burn with a cheerful flame, are easy to ignite and are very reactive fuels. They are suitable for open fires; smaller sizes are suitable for roomheaters, boilers and cookers.

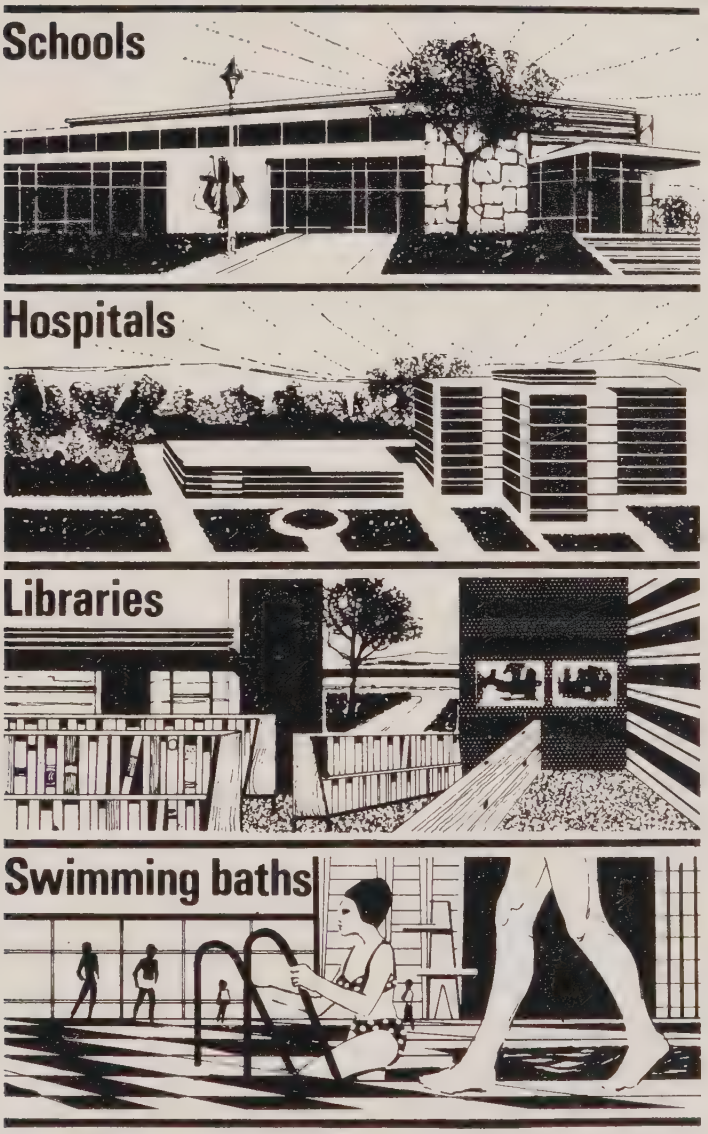
Gloco and Sebrite

These fuels are produced to a British Standard Specification by the carbonization of selected coal and are carefully prepared for use in open fires which are specified for use with coke and preferably fitted with gas ignition. These fuels will not burn in old fashioned grates.

More and more local authorities are heating with

REXCO
Smokeless coal





clean, economical REXCO

REXCO is made from top grade coal—officially approved for use in Smokeless Zones. It's economical too—because it's long-burning and stores well. It's easy to light and to maintain.

REXCO is easily ordered from coal merchants or the National Coal Board.

For further advice contact:
National Carbonising Company Ltd. Mansfield, Notts. Telephone Mansfield 22357
Scottish Rexco Ltd. Comrie's Colliery, Oakley, Fife. Telephone Saline 345/6

It's Time to Change to Rexco — It's Smokeless!

Smoke Control Areas

Summary of Progress as at 31 March, 1968

(1) *Region*	(2) *No. of black area acres covered by smoke control orders confirmed or awaiting decision*	(3) *Percentage* of total black acre acreage in region so covered*	(4) *No. of black area premises covered by smoke control orders confirmed or awaiting decision*	(5) *Percentage* of total black area premises in the region*
Northern ..	24,183	19·30	117,751	21·29
Yorkshire and Humberside ..	134,994	35·85	459,953	39·38
East Midlands ..	43,241	14·75	142,779	27·89
Greater London ..	201,485	61·61	1,794,268	67·98
North Western ..	138,725	34·58	634,252	37·25
West Midlands ..	72,467	29·10	319,246	30·36
South Western ..	7,201	27·33	26,650	17·89
Totals (black areas)	622,296	35·08	3,494,899	44·95
Outside black areas (all parts) ..	109,464		373,639	
GRAND TOTALS	731,760		3,858,538	

*The percentage shown in columns (3) and (5) above are percentages of the *total* acreage and of the *total* number of premises in the black areas concerned. In practice it may not always be necessary for the whole of the black area authority's district to be covered by smoke control orders (e.g. there may be some areas of open country).

Note:
Statistics in respect of Wales and Monmouthshire are no longer included.

Local Authorities Outside the Black Areas

Local Authorities outside the Black Areas who have Smoke Control Areas in operation, with total acreages and premises to 1.6.68

	Acreage	*Premises*
Aylesbury B.	275	535
Basildon U.D. ..	2,758	17,857
Bedford B.	1,358	5,510
Blaby R.D.	267	1,850
Blackburn R.D. ..	260	413
Brentwood U.D. ..	219	2,799
Burton-on-Trent C.B.	180	1,548
Cambridge B.	411	1,453
Chatham B.	887	4,632
Cheltenham B. ..	840	1,493
Cheshunt U.D. ..	794	4,115
Corby U.D.	441	3,566
Crawley U.D. ..	3,679	11,198
Crewe B.	702	3,785
Darlington R.D. ..	379	2,702
Elstree R.D.	500	2,877
Exeter C.B.	3,652	7,728
Gillingham B. ..	4,053	9,168
Glanford Brigg R.D. ..	1,526	1,860
Gloucester C.B. ..	85	672
Grantham B.	1,043	3,260
Gravesend B.	686	1,381
Harlow U.D.	5,889	17,291
Hazel Grove and Bramhall U.D. ..	521	2,434
Heanor U.D.	40	7
Hemel Hempstead B...	2,672	6,462
High Wycombe B. ..	2,414	7,727
Kingswood U.D. ..	12	130
Lancaster B.	2,579	2,642

	Acreage	*Premises*
Leamington Spa B.	841	2,414
Leek U.D.	96	18
Letchworth U.D.	1,103	3,611
Lincoln C.B.	1,389	408
Luton C.B.	2,106	12,005
Marple U.D.	69	405
Meriden R.D.	1,840	16,319
Northfleet U.D.	393	1,317
Old Fletton U.D.	123	962
Oxford C.B.	1,545	4,443
Peterborough B.	354	1,924
Potters Bar U.D.	730	1,669
Reading C.B.	1,339	5,926
Rochester B.	1,949	5,270
Rugby B.	1,528	4,311
Runcorn R.D.	23	170
Saddleworth U.D.	227	413
Scunthorpe B.	2,791	8,200
Seaton Valley U.D.	1,960	396
Seisdon R.D.	57	24
Shrewsbury B.	379	582
Skelmersdale U.D.	671	237
Skipton U.D.	715	1,883
Slough B.	2,497	10,038
Southampton C.B.	713	3,847
South East Derbyshire R.D.	28	288
Southport C.B.	67	250
Staines U.D.	6,364	11,183
Stanley (Co. Durham) U.D.	880	100
Thurrock U.D.	3,061	8,669
Todmorden B.	320	3,134
Waltham Holy Cross U.D.	50	358
Warwick B.	147	1,241
Watford B.	1,357	5,284
Wellington U.D.	232	11
Wetherby R.D.	157	670
Whiston R.D.	314	3,316
Whitley Bay B.	766	2,370
Wilmslow U.D.	257	1,803
Winsford U.D.	453	4,404
Wortley R.D.	460	1,368

Major Smog Disasters

The word " smog " was first used by the late Dr. H. A. Des Vœux, founder-president of the N.S.A.S., in 1905, to denote the combination of smoke and natural fog that in urban areas may have disastrous consequences. There are numerous cases of smog conditions resulting in a marked rise in mortality and morbidity from respiratory disorders and consequential cardiac failure. Among these incidents are the following.

London, 1873. Rise in bronchitis deaths, compared with the previous week, of 268.

London, 1880. Rise in bronchitis deaths, compared with the previous week, of 692.

London, 1891. Rise in bronchitis deaths, compared with the previous week, of 572.

Glasgow, 1909. Average number of deaths in the 3 weeks prior to the fog were 57 per week. During 5 weeks of fog or haze the deaths per week were: 138, 233, 171, 198 and 137.

Manchester and Salford, 1930-31. In December, with no fog, there were 137 respiratory disease deaths. In January there were 9 days heavy fog and 592 deaths.

Meuse Valley, 1930. 60 deaths attributed to fog, the death rate rising to 10·5 times the normal. Many cattle had to be slaughtered.

London, 1948. Bronchitis deaths in week before fog, 73; in the week of fog, 148.

Donora, U.S.A., 1948. 18 deaths in a population of 14,000. 42 per cent of the population were estimated to have suffered from illness.

London, 1952. The fog developed on Friday, 5th December and continued until 8th December. Estimated total of 4,000 deaths in the Greater London area. In the Administrative County only deaths from bronchitis rose from 121 to 872, and from heart and circulatory diseases, from 318 to 801.

London, 1956. 1,000 additional deaths attributed to January fog in the Greater London area. (*B.M.J.*, 31 *March*, 1956.)

London, 1962—Fog in London and other areas, December 3-7, with similarities to the 1952 fog, but with 750 additional deaths as compared with 4,000.

Principal References

Mortality and Morbidity during the London Fog of December, 1952. Ministry of Health Public Health Report No. 95. (This report contains a section on " Previous Fog Incidents," with a statistical appendix for those in London.)

Les Problèmes de Pollution de l'Atmosphère, Batta, Firket and Leclerc, Liége, 1937.

Air Pollution in Donora, Pa. Public Health Bulletin, No. 306, Federal Security Agency, Public Health Service, Washington.

Gas Coke manufactured in continuous vertical retorts also comes within this category and is suitable for use on the open fire.

Smaller sizes of these fuels are suitable for roomheaters, boilers and cookers.

Sebrite is manufactured by the South Eastern and Eastern Gas Boards and is available only in South East England.

Homefire

Homefire is a six-sided briquette three inches in diameter and one and a quarter of an inch thick. It has much the density of coal and a very low ash content.

It is a reactive fuel burning with a bright flame and is produced by the National Coal Board at Coventry. This fuel is suitable for open fires and at present is available in parts of the Midlands, and the London Area.

Multiheat

Mild heat treatment briquettes being produced at the Crown Fuel Works in Cardiff. They have anthracite as a main constituent and are manufactured by the National Coal Board.

Multiheat briquettes are ovoid in shape, strong and dense. This fuel is designed for use in roomheaters, boilers and the improved open fire and supplies are available mainly in the South of England the South West, the Midlands and the North West.

Sunbrite

Sunbrite a British Standard Specification fuel is a hard coke produced by the carbonization of selected coals at a high temperature in coke ovens. It is carefully prepared and selected for domestic heating appliances.

It is manufactured by the National Coal Board, the Steel Companies and the Independent Coke Producers.

Sunbrite is suitable for use in roomheaters, boilers and cookers, fires with under-floor primary air for combustion and fan-assisted open fires.

The International Union of Air Pollution Prevention Associations

The International Union that has now been established consists of non-governmental organisations only. Its primary functions are to promote collaboration and the exchange of information on air pollution problems, and to organize, through its member associations, international congresses. Particulars of the six founder member associations are given below. The first Congress of the Union was held in London in 1966.

The Second International Clean Air Congress will be held in Washington, D.C., U.S.A., from 8 December to 13 December, 1970. The President will be Dr. C. E. Barthel, Jnr., and the Secretary, Mr. Arnold Arch.

Air Pollution Control Association of America. 4400 Fifth Avenue, Pittsburgh, Pennsylvania 15213.

Established in 1907, with a full-time secretariat since 1950. The Association is a voluntary, co-operative, non-profit organization of 4,600 members who include engineers, scientists, enforcement officials, industrial organization and manufacturers. The Association serves as a forum for discussion of air pollution problems with technical orientation.

It publishes the monthly *Journal of the Air Pollution Control Association*, as well as its *APCA Abstracts*. The Abstracts contain summaries from 4,000 technical journals throughout the world of current air pollution literature.

The Association, governed by a body of 17 members of the Board of Directors, has the purposes of fostering the control of air pollution and improving sanitation of the air. The Association's Technical Council, composed of 40 volunteer committees, works towards international adoption of reasonable engineering performance standards. In addition to members from the United

States, the Association presently has members from 40 other countries.

President, 1968-9: John S. Lagarias.

Executive Secretary: Arnold Arch.

Asociación Argentina Contra la Contaminación del Aire. Sarmiento 680, Buenos Aires, Argentina.

Founded in 1962 as a result of the first Latin American Conference on Air Pollution, and obtained the legal status of a civil association in 1964.

The present membership of 100 includes doctors in medicine, hygiene and chemistry; sanitary engineers, army officers, executives and industrial enterprises. Though non-governmental, many of the members are civil service officers. A grant is made to the association by the municipality of Buenos Aires.

The aims are for the public welfare and to promote the fight against air pollution in the urban and industrial centres of the country, employing scientific, educational and cultural means. An international conference was held at Buenos Aires in November, 1965.

President: Dr. José A. Rispoli.

Secretary-General: Dr. Damian D. Torti.

Association pour la Prevention de la Pollution Atmosphérique. 62 rue de Courcelles, Paris, 8, France.

The objects of the Association are to initiate and co-ordinate studies leading to a better understanding of the problems of air pollution; to organize investigations in the large towns with a view to determining the distribution of air pollution (for which regional groups have been set up); to co-operate with the public authorities in pollution control; to inform and instruct the public; to present exhibitions under the patronage of the Ministry of Health in the large towns; and to publish the three-monthly journal *Pollution Atmosphérique.*

President: M. le Professeur Moureu

Secretary-General: M. Y. Queret.

National Society for Clean Air. Field House, Breams Buildings, London, E.C.4, England.

Full details of the Society will be found in the colour pages of this volume.

VDI-Kommission Reinhaltung der Luft. Dusseldorf, Graf-Recke-Str. 84, Federal Republic of Germany.

The VDI Clean Air Commission is a specialized section of a technical and scientific association, the Verein Deutscher Ingenieure (German Association of Engineers). It comprises collaborators from all the branches of knowledge relating to clean air, including practice, legislation and administration.

Their functions include: determining the causes, nature and extent of air pollution; making emission limits for dust and gases; research on the emission of pollutants and on chimney heights; research on the effects of air pollution; fixing the maximum allowable concentrations for ambient air (Maximale Immissions-Konzentrationen, or MIK); establishment or development of standard procedures for the measurement of dusts and gases both at the discharge points and in ambient air.

There are at present in the Commission more than 480 independent experts and scientists working in honorary capacities on numerous committees, sub-committees and working-groups. The results of their work are laid down in VDI Richtlinien (guidelines)—Handbuch Reinhaltung der Luft (Clean Air Handbook)—arranged as follows: (i) General; (ii) MIK values, (iii) dispersion of pollutants, (iv) limiting emissions, (v) analysis and measuring techniques. So far, 60 directives have been published; 33 others are either in preparation or planning stage. The Commission also initiates research studies, of which over 120 have been started so far. More than 12m. D.Marks have been provided by public funds for this purpose. (More details of the work of the Commission are included in a booklet "Aufbau, Aufgaben, Forschung", which will be supplied on request by the Commission.)

President: H. Stephany, Min.-Dirig. a.D. Dipl.-Ing.
Secretary: J. Krämer, Dipl.-Ing.

Besides the VDI Clean Air Commission there exists a special documentation centre (VDI-Fachdokumentation Reinhaltung der Luft) which covers the publications in the whole field of air pollution. Up to now, nearly 50,000 citations have been collected and indexed according to a special system. Comprehensive bibliographies are in preparation.

Secretary: W. Seidl.

Heat Control Society, Japan. Kanto-Shin-Etsu Heat Control Society, 9-17, chóme, Mejorodai, Bunkyo, Tokyo, Japan.

The purposes and activities of the Society are to conduct diagnoses of problems, lecture and training courses (including by correspondence) and other publicity activities to promote efficiency of fuels for the following purposes: (i) prevention of loss of fuels; (ii) prevention of heat losses during transmission and transportation; rationalization of combustion, gasification, distillation, heating and heat transmission; and prevention of air pollution from industrial plant.

There are seven other similar societies covering the whole area of Japan. The eight organize central conferences on heat control. Total expenditure is about £63,000 and total membership about 1,900 concerns.

Central Conference on Heat Control
President: Arimasa Baba, D.E.
Standing Director: Takahide Taga

Kanto-Shin Etsu Heat Control Society
President: Shige Kaweda
Chief Director: Takahide Taga

The Clean Air Society of Australasia

Hon. Secretary: G. J. Cleary, Post Office Box 31, George Street North Post Office, Sydney, New South Wales, Australia.

The Cost of Air Pollution

The most recent general inquiry into the cost of air pollution in Britain was made by a sub-committee of the Committee on Air Pollution (the Beaver Committee), the findings of which were included as an appendix in the final report of the Committee in 1954. Members of the Committee have since stated that they consider the estimates to be too conservative.

The main conclusions of the Report were:

(1) The direct costs of pollution to which figures can be put ("however hazardous") are as follows:

	£m. per annum
Laundry	25
Painting and decorating	30
Cleaning and depreciation of buildings other than houses	20
Corrosion of metals	25
Damage to textiles and other goods	52·5
	152·5

It is considered that these figures are underestimates, and as certain items have been omitted, it is concluded that the direct costs of air pollution are *of the order of at least £150 million a year.*

(2) The "loss of efficiency". The following figures are given as "a rough guess at possible orders of magnitude": £10m. a year loss to agriculture; £55m. a year loss of working efficiency in manufacturing industry; £60m. a year in other sections, including transport—altogether "the loss of efficiency resulting from pollution might be as great as the direct costs", but to avoid danger of over-estimates a figure of £100m. a year is suggested.

(3) The value of the fuel lost under the conditions which produce smoke is estimated to be £25m. to £50m. a year, but it is considered that this should not be included as one of the costs of pollution.

The total estimated cost is given as £250m. a year, equivalent to £10 per head in the black areas and £5 elsewhere throughout Great Britain, plus the value of the fuel lost.

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No dustman's hat or gorblimey trousers—but still a dustman—a specialist in dust and fume control backed by the experience and know-how of associated companies all over the world.

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The Clean Air Case

A Synopsis for the Guidance of Speakers, Writers, Teachers, etc.

1. Historical Background. Growth of the air pollution problem and efforts to abate it, from 1273 to the present day. (*See History table.*)

2. Nature, Sources and Causes, Smoke: Due to incomplete combustion; consists of fine carbonaceous particles and tarry droplets. (For quantities produced, *see Table.*)

Gases: Sulphur dioxide the most harmful, especially when in association with smoke particles. Also carbon monoxide, and noxious gases and fumes from chemical processes. See the Society's Report on *Sulphur Dioxide as an Air Pollutant.*

Grit and dust: Mainly from industrial sources, e.g., pulverized coal and high-draught furnaces.

3. Extent and Behaviour of Pollution. Measurement of floating and deposited impurities, sulphur dioxide, and of light values. The Investigation under the Warren Spring Laboratory (*q.v.*).

4. Fog. Natural and smoke fogs, their formation and characteristics. The London, 1952, 1962, and other lethal smogs.

5. Effects. *Health:* Effects on respiratory system. Effects due to obstruction of natural light. Possible relationship with lung cancer. Psychological and social consequences of life in smoke-ridden environment. Effects of smog are the result of infrequent high concentration of pollution, whereas the insidious action of " normal " pollution takes place continuously.

Plant Life: Principal factors injurious to vegetation are: loss of sunlight, blocking of stomata by deposits, direct attack by chemicals, acidification of soil. Indirect effect on grazing animals through deterioration of herbage, or of poisoning in the case of fluoride pollution.

Materials: Corrosion or erosion of metals, stone, fabrics, leather, etc.

Visibility: Loss of visibility due to smoke haze and smog affecting air and surface transport.

Costs: See information on page 42

6. Prevention. *Industrial Smoke:* calls for correct equipment, maintenance and operation of plant. Value of mechanical stoking. Uses of oil, gas, electricity and smokeless solid fuel. Importance of training and certification of stokers. Instrumentation, smoke alarms, etc. Need for all-round fuel efficiency. *Dust and grit:* Use of arrestors of appropriate types: cyclones, wet washing, electrostatic precipitators. *Sulphur:* removal by coal washing, flue gas-washing and other possible means. Importance of high chimneys and emission velocity.

Domestic: By use of smokeless fuels—gas, electricity, oil or solid. *See article describing the types of solid smokeless fuel.* Need for efficient appliances. Central and district heating, whole-house warming, off-peak electrical methods, etc. Smoke control areas, purpose and national programme.

Railways and Roads: Use of diesels and electricity for the former. Need for efficient combustion and good maintenance in road vehicles, possible development of catalytic afterburners and other devices.

7. Policy, Law, etc. The present law —Clean Air Act, 1956, Public Health Act, 1936, local Acts, Road Traffic Act, 1930, Alkali, etc., Works Regulation Act, 1906, and Orders, etc. The Beaver Report and its proposals. Responsibilities of local authorities and central Government. Smokeless zones and smoke control areas. Work of the Warren Spring Laboratory, Alkali Inspectorate and other organizations. Educational and publicity work of the National Society for Clean Air.

(*See also the NSCA booklet "Clean Air Lecture Notes"*, 1*s.* 6*d.*)

British Standards relating to Air Pollution

B.S.	
758	Small domestic hot-water supply boilers using solid fuel. Part 1. Manually-controlled boilers. Part 2. Thermostat-controlled boilers.
893	Method of testing dust extraction plant and the emission of solids from chimneys of electric power stations.
1251	Open fireplace components. Part 1. Firebacks for use with inset open fires.

Part 2. Fireplace surrounds and hearths.
Part 3. Adjustable chimney-throat restrictors (insertible).
Part 4. Lintels.

1252 Domestic solid fuel cookers with integral boilers.

1334 Thermal insulating materials.

1747 Methods for the measurements of air pollution.
Part 1. Deposit gauges.
Part 2. Determination of concentration of suspended matter.
Part 3. Determination of sulphur dioxide.
Part 4. The lead dioxide method.

1756 Methods for the sampling and analysis of flue gases.
Part 1. Methods of sampling.
Part 2. Analysis by the Orsat apparatus.
Part 3. Analysis by the Haldane apparatus.
Part 4. Miscellaneous analyses.
Part 5. Semi-routine analyses.

2740 Simple smoke alarms and alarm metering devices.

2741 Recommendations for the construction of simple smoke viewers.

2742 Notes on the use of the Ringelmann Chart.
C: 1957 Ringelmann Chart.
M: 1960 Miniature smoke chart.

2811 Smoke density indicators and recorders.

2845 Coke-burning inset open fires without boiler and without convection.
Part 1. Dimensional and constructional requirements.
Part 2. Performance and constructional requirements.

2978 Measurements of smoke emission from industrial boilers.
Part 1. Medium capacity coal-fired water-tube boilers with travelling grates.
Part 2. Coal-fired shell boilers with various types of mechanical stokers.

3107 Small incinerators for the destruction of hospital dressings.

3128 Constructional and performance requirements for inset open fires with boiler and without convection.

3142 Manufactured solid smokeless fuels for household use.
Part 1. Cokes for domestic open fires.
Part 2. Cokes for domestic closed appliances.

3250 Thermal testing of domestic solid fuel burning appliances with convection.
Part 1. Flue loss method.
Part 2. Hood method.

3316 Large incinerators for the destruction of hospital waste.

3328 Domestic gas pokers and portable underbar ignition burners.

3376 Open fires with convection, with or without boiler.

3377 Back boilers for domestic solid fuel appliances.

3378 Domestic heating stoves using coke and other solid fuels.

3405 Simplified methods of measurement of grit and dust emission from chimneys.

3813 Incinerators for waste from trade and residential premises.
Part 1. 1964 Capacities between 50 lb/h and 1,000 lb/h.

3841 Method for the measurement of smoke from manufactured solid fuels for domestic open fires.

3929 Domestic solid fuel ignition pokers and portable undergrate ignition burners for use with commercial butane.

4076 Steel chimneys.

All the above Standards are obtainable direct from the British Standards Institution at British Standards House, 2 Park Street, London, W.1 (individual copies) or Newton House, 101-113, Pentonville Road, London, N.1 (bulk orders). British Standards are revised, when necessary, by the issue either of amendment slips or of revised editions. It is important that users of British Standards should ascertain that they are in possession of the latest amendments or editions.

The History of Air Pollution in Great Britain

A Chronological Table

1273	Use of coal prohibited in London as being " prejudicial to health."
1306	Royal Proclamation prohibiting artificers from using sea-coal in their furnaces. Record of the execution of one offender.
1307	Commission of Inquiry appointed to " inquire of all such who burnt sea-coal in the city or parts adjoining, and to punish them for the first offence with great fines and ransoms, and upon the second offence to demolish their furnaces."
1578	Queen Elizabeth I " findeth herselfe greately greved and anoyed with the taste and smoke of the sea-cooles."
1648	Petition of Londoners to Parliament to prohibit the importation of coal from Newcastle on account of the injury they experienced.
1661	John Evelyn submitted his " Fumifugium, or the Smoake of London Dissipated," to Charles II.
1819	Committee appointed by Parliament to inquire how far persons using steam engines and furnaces could erect them in a manner less prejudicial to public health and comfort.
1843	A Select Committee recommended the introduction of a Bill dealing with nuisances from furnaces and steam engines.
1845	Another Select Committee reported that it was not desirable to extend the provisions of an Act beyond furnaces used for steam generation.
1847	The Town Improvement Clauses Act contained a section dealing with factory smoke.
1853-6	Smoke Abatement Acts relating to the Metropolitan area.
1866	The Sanitary Act empowered sanitary authorities to take action in cases of smoke nuisances.
1875	The Public Health Act containing a smoke abatement section on which legislation to the present day has been based.
1881	Smoke Abatement Exhibition at South Kensington organized by the Public Health and Kyrle Societies.
1882	Formation of the National Smoke Abatement Institution.
1891	The Public Health (London) Act.
1899	Formation of the Coal Smoke Abatement Society, led by Sir William Richmond, R.A. and Dr. H. A. Des Vœux (concerned mainly with London).
1909	Sheffield smoke abatement Exhibition, at which was set up the Smoke Abatement League of Great Britain (mainly for the provinces and centred later in Manchester and Glasgow).
1912	International smoke abatement Exhibition in London, organized by the Coal Smoke Abatement Society, leading to the formation of a Committee for the Investigation of Atmospheric Pollution.
1913	Smoke abatement Bill introduced in the House of Commons by A. G. C. Harvey, M.P.
1914	Smoke abatement Bill introduced in the House of Lords by Lord Newton. Withdrawn on the appointment of a Departmental Committee to investigate the problem.
1920	Committee re-formed after the war with Lord Newton as Chairman.
1921	Publication of the Final Report of the Newton Committee.
1926	Public Health (Smoke Abatement) Act by which the 1875 and 1891 Acts were amended and extended.
1927	Establishment of first regional committees of local authorities.
1929	Amalgamation of the Coal Smoke Abatement Society and Smoke Abatement League of Great Britain to form the National Smoke Abatement Society. First publication of a journal (now *Smokeless Air*) devoted to air pollution.
1936	Public Health Act, in which were included the provisions of the smoke abatement Act of 1926.
1946	Simon Report on Domestic Fuel Policy, recommending, *inter alia*, measures for domestic smoke prevention.

1946	First smokeless zone and prior approval legislation (Manchester Corporation Act).
1951	First smokeless zone established (in Coventry).
1952	Ridley Report on " Policy for the Use of Fuel and Power Resources," recommending, *inter alia*, measures for smoke prevention.
1952	London smog disaster, the most serious for many years, with a death roll of 4,000 (*q.v.*).
1953	Beaver Committee on Air Pollution set up by the Government and published an Interim Report.
1954	Final Report of the Beaver Committee.
1954	A Clean Air Bill introduced by Gerald Nabarro, M.P., and withdrawn (4th Feb., 1955) on Government undertaking to introduce their own Bill.
1955	Whole of City of London declared a smokeless zone.
1956	Clean Air Act.
1958	National Smoke Abatement Society became incorporated under new name of National Society for Clean Air.
1959	International Diamond Jubilee Clean Air Conference and Exhibition (NSCA), London.
1962	Smog episode in London and other cities. Estimated death roll of 750 in Greater London.
1962	Holborn M.B. first local authority in country to reach its final target under Clean Air Act.
1964	Amendments to Clean Air Act in Housing Act, 1964, modifying smoke control area policy. Clean Air Act (Northern Ireland).
1966	First Congress of the new International Union of Air Pollution Prevention Associations (in London).

Recent Books, Papers and Reports

A Selected List

Industrial

Industrial Chimneys for Oil-Fired Plant. Knox, G. Smokeless Air, No. 143. Autumn 1967. (3s.).

The Role of Oxygen-Fuel Burners in Scrap Consuming Steelmaking Processes and their effect on Fume Emission. Spenceley, G. D. Nat. Soc. for Clean Air Proc. Blackpool Conference. 1967. (25s.).

Problems arising from the use of Asbestos. Memorandum of the Senior Medical Inspector's Advisory Panel. Min. of Labour, H.M. Factory Inspectorate. 1967. H.M.S.O. (3s. 9d. net).

British Experience with Tall Stacks for Air Pollution Control on Large Fossil-fuelled Power Plants. Stone, G. N. and Clarke, A. J. (presented Americ. Power Conference April 1967). Published C.E.G.B., London.

Effects of Air Pollution

Air Pollution. Edited by Stern, Arthur C. 1968. Vol. 1. Air Pollution and its Effects. pp. 850. Academic Press, New York and London. (£13 1s. net.).

Lung Cancer and Bronchitis in Relation to Cigarette Smoking and Fuel Consumption in Twenty Countries. Stocks, P. Brit. Journal of Preventive and Social Medicine. (21, No. 4. Oct. 1967).

The Effects of Air Pollution on Plants and Soil. Webster, C. C. Agricultural Research Council. pp. 53, H.M.S.O. (6s. net.)

Pesticides and Pollution. Mellanby, Kenneth. pp. 221. Collins, London. (30s.).

General

Man and Environment. Arvill, Robert. pp. 332. Pelican Original, Penguin Books Ltd., Harmondsworth. (8s. 6d.).

Economic Costs of Air Pollution: Studies in Measurement. Ridker, Ronald G. Praeger Special Studies in U.S. Economic and Social Development, pp. 125, Frederick A. Praeger, New York, Washington, and London.

Controlling Pollution: the economics of a cleaner America, edited by Marshall

I. Goldman, pp. 175. Prentice-Hall Inc. Englewood Cliffs, N.J., 1967. (£2 cloth, 17s. paper).

Clean Air and the North West Environment. Aylmer Coates, U. Nat. Soc. for Clean Air Proc. Blackpool Conference 1967. (25s.).

Industrial and Municipal Incineration of Refuse. Ostle, E. J. Nat. Soc. for Clean Air Proc. Blackpool Conference 1967. (25s.).

Some Specific Air Pollution Problems. Bonnell, J. A. and Lawther, P. J. Nat. Soc. for Clean Air Proc. Blackpool Conference 1967. (25s.).

Some Mineralogical Aspects of Air Pollution Damage to Limestone. Henley, K. J. Nat. Soc. for Clean Air Proc. Blackpool Conference 1967. (25s.).

Corrosion by Air Pollution: A Review, Goss, J. R. Nat. Soc. for Clean Air Proc. Blackpool Conference 1967. (25s.).

Environment, Housing and Health. Martin, A. E. "Urban Studies" Feb. 1967, Vol. 4. No. 1. (publ. Oliver & Boyd Ltd., Edinburgh and London).

Domestic

The Cost of Domestic Smoke Control. Smith, A. R. Nat. Soc. for Clean Air Proc. Blackpool Conference 1967. (25s.).

Smokeless Heating in New Housing. Report presented by T. H. Iddison, Nat. Soc. for Clean Air Proc. Blackpool Conference 1967. (25s.).

Fuel

Nuclear Power. Sir William Penney. The Citrine Lecture presented to the British Electrical Power Convention, May 1967.

Electricity and Nuclear Power. Donald Clark. Presented April 1967 to the Conference on "Power in the 1970's". Public Relations Branch, C.E.G.B., Sudbury House, 15 Newgate St., London, E.C.1.

Sulfur Content of Crude Oils of the Free World. Bureau of Mines Reports of Investigations 7059. Superintendent of Documents, U.S. Gov. Printing Office, Washington D.C. 20402. (30c.).

The Emission of Grit and Dust from Furnaces. Hicks, D. Nat. Soc. for Clean Air Proc. Blackpool Conference 1967. (25s.).

Road Vehicles

Power Systems for Electric Vehicles. (Public Health Service Publication 999-AP-37). U.S. Dept. of Health, Education and Welfare. Nat. Centre for Air Pollution Control. Cincinnati, Ohio, 1967.

Research and Investigation

Warren Spring Laboratory Report for 1966. Ministry of Technology, pp. 74. H.M.S.O. (8s. 6d. net).

Guide to Publications

This list of available books, reports and pamphlets on smoke prevention, atmospheric pollution and fuel usage is issued by the National Society for Clean Air as a reference guide for readers. It may also be used for ordering the publications which may be obtained either direct from the Society, or other bookseller. In ordering from the Society please quote the code number preceding each title.

Prices in brackets include postage and packing, which must be included when ordering by post, except in the case of orders over £3, which will be sent post-free. If a number of items are ordered together excess postages will be refunded. Prices quoted are those current at the date of publication, and are subject to variation.

Information about older, out-of-print, and overseas publications may be obtained from the Society on request. Most of these are in the Society's library and can be consulted, or in some cases borrowed for short periods, by arrangement.

Except where otherwise stated the publisher is the Society. HMSO.—H.M. Stationery Office. The publications are numbered and orders to the Society may be made by the code number.

Legislation

Acts and Memoranda

82. **Clean Air Act, 1956.** The latest Statute governing smoke, containing sections on dark smoke, smoke from furnaces, grit and dust from furnaces, smoke control areas, smoke nuisances, special cases, clean air council and miscellaneous provisions. (HMSO., 1956) 4 & 5 Eliz. 2 Ch. 52. 2s. (2s. 5d.)

83. **Clean Air Act, 1956.** Memorandum on Smoke Control Areas. (HMSO, 1956) 1s. 3d. (1s. 6d.)

84. **Clean Air Act, 1956.** Memorandum on Miscellaneous Provisions. (HMSO, 1956) 8d. (11d.)

85. **Amendment to Model Byelaws.** Series IV Buildings (1953) Edition. (HMSO, 1956) 2d. (5d.)

80. **The Clean Air Act, 1956.** A descriptive Summary. (N.S.C.A.) 4s. 6d. per dozen, post free 6d. single copy.

105. **Thermal Insulation (Industrial Buildings) Act, 1957.** (5 & 6 Eliz. 2 Ch. 40). (HMSO, 1957) 6d. (9d.)

118. **Clean Air Act, 1956. Memorandum on Industrial Provisions.** (HMSO, 1958) 1s. (1s. 3d.)

125. **Clean Air Act, 1956. Memorandum on Miscellaneous Provisions (Scotland).** (HMSO, 1959). 1s. (1s. 6d.)

195. **Housing Act 1964** (HMSO). 8s 6d. (9s. 1d).

196. **West Riding County Council (General Powers) Act, 1964.** (HMSO) 3s. (3s. 6d.)

197. **Clean Air Act (Northern Ireland) 1964. Belfast.** (HMSO) 3s. 6d. (3s. 11d.)

262. **Chimney Heights. Second edition of the 1956 Clean Air Act Memorandum.** (HMSO, 1967). 2s. 6d. (3s.)

262 (a) **Chimney Height Charts.** The Appendices to the Clean Air Act publication "Chimney Heights" printed on permatrace. (HMSO, 1967). 14s. (14s. 4d.)

264. **Report of the Working Party on Grit and Dust Emission.** (MHLG Memorandum) (HMSO) (3s. net)

Regulations (Statutory Instruments)

86. **Clean Air: The Smoke Control Areas (Authorized Fuels) Regulations, 1956.** Statutory Instruments, 1956 No. 2023. (HMSO, 1956) 2d. (5d.)

104. **Clean Air Council Order, 1957.** Statutory Instruments No. 766, 1957. (HMSO) 3d. (6d.)

113. **Smoke Control Areas (Exempted Fireplaces) Order, 1957.** S.I. No. 541, 1957. (HMSO) 2d. (5d.)

233. **Alkali, etc., Works Order, 1966.** S.I. No. 1143, 1966. (HMSO) 1s. 6d. (1s. 9d.)

117. **Dark Smoke (Permitted Periods) Regulations, 1958.** S.I. No. 498, 1958. 3d. (6d.)

119. **Dark Smoke (Permitted Periods) (Vessels) Regulations, 1958.** S.I. No. 878, 1958. (HMSO) 3d. (6d.)

120. **Clean Air Act, 1956 (Appointed Day No. 2) (Scotland) Order, 1958.** S.I. No. 1931, 1958. (HMSO) 2d. (5d.)

121. **Alkali, etc., Works (Scotland) Order, 1958.** S.I. No. 1932, 1958. (HMSO) 3d. (6d.)

122. **Dark Smoke (Permitted Periods) (Scotland) Regulations, 1958.** S.I. No. 1933, 1958. (HMSO) 3d. (6d.)

123. **Dark Smoke (Permitted Periods) (Vessels) (Scotland) Regulations, 1958.** S.I. No. 1934, 1958. (HMSO) 3d. (6d.)

137. **Smoke Control Areas (Exempted Fireplaces) Order, 1959.** S.I. No. 1207, 1959. (HMSO) 3d. (6d.)

139. **Smoke Control Areas (Exempted Fireplaces) (Scotland) Order, 1959.** S.I. No. 2264 (S. 123), 1959. (HMSO) 3d. (6d.)

191. **Clean Air: The Smoke Control Areas (Authorized Fuels) Regulations 1963.** S.I. No. 1275, 1963. (HMSO, 1963) 3d. (6d.)

198. **The Alkali etc., Works (Scotland) Order, 1965.** S.I. No. 478 (S. 23) 1965. (HMSO) 9d. (1s.)

204. **The Building Standards (Scotland) Regulation, 1963.** S.I. No. 1897 (S. 102) 1963. (HMSO) 11s. 6d. (12s. 2d.)

219. **The Smoke Control Areas (Exempted Fireplaces) (Scotland) Order 1965.** S.I. No. 1284 (S. 57) (HMSO) 3d. net

220. **The Smoke Control Areas (Authorized Fuels) Regulations 1965.** S.I. No. 1508 (HMSO) 3d. net

221. **The Smoke Control Areas (Exempted Fireplaces) Order, 1966.** S.I. No. 217 (HMSO) 3d. net

222. **The Smoke Control Areas (Exempted Fireplaces) (Scotland) Order 1966.** S.I. No. 715 (S. 46) (HMSO) 5d. net

223. **The Smoke Control Areas (Authorized Fuels) (Scotland) Regulations 1966.** S.I. No. 714 (S. 45) (HMSO) 3d. net

234. **The Motor Vehicles (Construction and Use) Regulations 1966.** (HMSO) 6s. 6d. net

263. **The Clean Air (Measurement of Grit and Dust) Regulations, 1968.** S.I. No. 431. (HMSO). (6d. net)

Circulars

124. **Smoke Control Areas.** Circular No. 5/59 (26/1/1959). (HMSO) 6d. (9d.)

138. **Exempted Fireplaces Order, 1959.** Circular No. 44/59 (16/7/1959). (HMSO) 3d. (6d.)

164. **Use of Sticks and Paper in Smoke Control Areas.** Circular No. 28/60 (7/7/60). (HMSO) 9d. (1s.)

166. **Notification of Provisional Plans for establishing Smoke Control Areas.** Circular No. 1/61 (16/1/1961). (HMSO) 3d. (6d.)

167. **Air Pollution—Measurement and Research.** Circular No. 12/61 (10/4/1961). (HMSO) 3d. (6d.)

168. **Selection of Open Fires for Coke Burning.** Circular No. 28/61 (5/6/1961). (HMSO) 3d. (6d.)

169. **Works of Adaptation Eligible for Grant.** Circular No. 31/61 (26/6/1961). (HMSO) 3d. (6d.)

170. **Industrial Furnaces.** Circular No. 42/61 (29/8/1961). (HMSO) 2d. (5d.)

171. **Smoke Control in the Black Areas.** Circular No. 4/62 (30/1/1962). (HMSO) 5d. (8d.)

172. **Smoke Control Areas.** Circular No. 3/62 (30/1/1962). (HMSO) 1s. (1s. 3d.)

177. **Alkali, etc., Works Regulation Act, 1906.** Circular No. 23/63 (22/3/63). (HMSO)

178. **"Homes for Today and Tomorrow".** Circular No. 13/62 (12/2/62). (HMSO) 3d. (6d.)

179. **Fuel Storage in New Local Authority Housing.** Circular No. 50/62 (1/10/62) (HMSO) 3d. (6d.)

180. **Smoke Control Programmes, 1962-1966.** Circular No. 60/62 (18/12/62). (HMSO) 3d. (6d.)

181. **Gas Cokes as Open Fire Fuels.** Circular No. 7/63 (2/4/63 (HMSO) (8d.)

188. **Chimney Heights.** Circular No. 25/63 (15/5/63). (HMSO) 3d. (6d.)

190. **Smoke Control Areas.** Circular No. 69/63 (17/12/63). (HMSO) 1s. (1s. 3d.)

205. **Housing Act 1964. Section 95: Amendment of the Clean Air Act, 1956.** Circular No. 46/64 (14/8/64). (HMSO) 5d. (8d.)

206. **Housing Act 1964. Designation of Direct Acting Electric Space-Heaters.** Circular No. 60/64 (18/12/64). (HMSO) 3d. (6d.)

207. **Disposal of old Motor Vehicles.** Circular No. 8/65 (11/2/65). (HMSO) 9d. (1s.)

208. **Smoke Control Areas: Supplies of Solid Smokeless Fuel.** Circular No. 13/65 (17/3/65). (HMSO) 9d. (1s.)

209. **Heating of Public Buildings.** Circular No 46/65 (2/6/65). (HMSO)

Smoke Control Areas: Grant Arrangements. Circular No. 51/65 (29/6/65). (HMSO)
265. **Smoke Control Areas: Grant Arrangements.** Circular No. 51/65. (29/6/65). (HMSO) 9d. (1s.)

224. **Tall Buildings and Industrial Emissions.** Circular No. 69/65 (18/10/65) (HMSO) 3d. net

225. **Smoke Control Areas: Estimates and Final Costs.** Circular No. 77/65 (31/12/65) (HMSO) 9d. net

226. **Smoke Control Areas (Authorised Fuels) (No. 2) Regulations 1965.** Circular No. 18/66 (16/3/66). (HMSO) 3d. net

235. **I Grant Arrangements. II Model Question and Answer Booklet. III Exempted Appliances.** Circular No. 25/66 (3/6/66). (HMSO) 1s. net

236. **Supplies of Solid Smokeless Fuels.** Circular 25/67 (Ministry of Housing and Local Government) Circular 35/67 (Welsh Office) (30/5/67) 8d. net

266. **Grit and Dust.** Circular 56/67. (MHLG) 23/67 (WO). 5d. net

267. **The Clean Air (Measurement of Grit and Dust) Regulations 1968.** Circular 11/68. (MHLG). 14/68 (WO). 6d. net.

Other Government Publications

58. **Committee on Air Pollution.** The Interim Report of the Beaver Committee appointed in July, 1953, to examine the nature, causes and effects of air pollution and the efficiency of present preventive measures; to consider what further preventive measures are practicable; and to make recommendations. (Cmd. 9011.) (HMSO, 1953.) 2s. 6d. (2s. 11d.)

71. **Committee on Air Pollution.** The Final Report of the Beaver Committee. (Cmd. 9322). (HMSO, 1954.) 5s. 6d. (5s. 11d.)

132. **The Efficient Use of Fuel.** (HMSO, for Ministry of Power). 35s. (37s.)

44. **Housing Manual, 1949.** The official recommendations on housing practice. The section on the heat installation may be regarded as the basis of present-day smoke prevention policy. (HMSO, 1949)

The Investigation of Atmospheric Pollution. Reports by the Fuel Research or Warren Spring Laboratory, Ministry of Technology co-ordinating local observations of atmospheric pollution.

75. **27th Report (1944-54).** (HMSO, 1955.) 7s. 6d. (8s. 2d.)

106. **28th (1954-55). Report** (HMSO, 1957.) 5s. 6d (6s. 1d.)

134. **29th Report (1955-56).** (HMSO, 1958.) 7s. (7s. 8d.)

237. **31st Report (1957-58).** (HMSO, 1966). 8s. (8s. 8d.)

238. **32nd Report (1958-66).** (HMSO, 1967.) 10s. 6d. (11s. 2d.)

182. **Smoke Control (England and Wales) 1962-66.** Summary of programmes of local authorities for establishment of Smoke Control Areas. (Cmnd. 1890, HMSO) 3s. 6d. (3s. 9d.)

227. **101st Annual Report on Alkali etc., Works for 1964.** Chief Inspectors, HMSO, 1965 (5s. 6d.)

228. **102nd Annual Report on Alkali etc., Works for 1965.** Chief Inspectors, HMSO, 1966. (7s. 6d.)

103rd Annual Report on Alkali etc., Works for 1966. Chief Inspectors, HMSO, 1967 (7s. 6d.)

268. **Report of the Working Party on Grit and Dust Emission.**(HMSO) (3s. net)

269. **Fuel Policy (Presented to Parliament by the Minister of Power, October 1965)** Cmnd. 2798. (HMSO) 3s. (3s. 6d.)

270. **Fuel Policy** (Presented to Parliament by the Minister of Power, November 1967) Cmnd. 3438. (HMSO) 8s. (8s. 6d.)

271. **Car for Cities. Reports of the Steering Group and Working Group appointed by the Minister of Transport.** (HMSO) £1 1s. (£1 2s.)

General

13. **Smokeless Air.** The Society's quarterly magazine-type journal. News, articles, photographs, comment. 12s. per annum, post free. 3s. (3s. 5d.)

131. **Air Pollution.** Ed. M. W. Thring. (Butterworths). 42s. (43s.)

15. **Fumifugium or the Smoake of London Dissipated.** John Evelyn. The famous diarist's well-known tract (1661) reprinted by the Society. Special tercentenary issue. Cloth bound 5s. (5s 6d.) Paper back 2s. 6d. (2s. 9d.)

142. **New Stoker's Manual.** (National Industrial Fuel Efficiency Service). 2s. 6d. (2s. 11d.)

183. **Air Pollution.** Ed. Arthur C. Stern. 1968. Vol. 1. Air Pollution and its Effects. pp. 850. Academic Press, New York and London. (£13 1s. net). Vol. 2 to be published late 1968.

193. **Smoke Inspector's Handbook** by A. Coe and I. M. Coe, from Clean Air Information Service, The College of Fuel Technology, 90 Talbot Road, London, N.6. Volume 1: 40s.; Volume 2: 50s. (post free).

194. **The Control of Air Pollution.** Alan Gilpin. pp. 514. Royal 8vo. London, Butterworths. 120s.

210. **Atmospheric Pollution: Its Origins and Prevention.** Meetham, A. R., in collab. with Bottom. D. W. and Cayton, S. 3rd revised edition. pp. 301, Pergamon Press, Oxford. 70s. net.

211. **Clean Air—Law and Practice.** Garner J. F. and Crow R. K. pp. 385. Shaw & Sons, London. 63s.
Supplement and Noter Up, (the law as on 1 August, 1967) pp. 119, Shaw & Sons, London. 12s. 6d.

212. **Gas Purification Processes.** Ed. by G. Nonhebel, pp. 894, George Newnes, London. £7 net

229. **Air Pollution.** Smith, A. R. Monograph No. 22, Society of Chemical Industry, 14 Belgrave Square, London, S.W.1. 1966. £3

Conference Proceedings

(Details of earlier Conference Proceedings available on request)

61. **Glasgow Conference, 1953.** The Des Vœux Memorial Lecture—"Atmospheric Pollution in Relation to Preventive Medicine," and papers on the London Fog Disaster, Smokeless Zones, Production, Use and Availability of Solid Smokeless Fuels and the Efficient and Smokeless Combustion of Fuel Oils. 7s. 6d. (7s. 11d.)

70. **Scarborough Conference, 1954.** The Des Vœux Memorial Lecture—"Air Pollution and Plant Life," Address by Sir Hugh Beaver, Presidential Address: "The Coal Crisis and the Society," papers on Rail Transport and Smoke Abatement, the Industrial Uses of Gas and the Industrial Uses of Electricity. 7s. 6d. (7s. 11d.)

87. **Southport Conference, 1956.** The Des Vœux Memorial Lecture—"Clean Air: The Next Chapter," Presidential Address, Progress Reports, Local Authorities and the Clean Air Act, Clean Air and the Housewife. 12s. 6d. (12s. 11d.)

98. **Hastings Conference, 1957.** The Des Vœux Memorial Lecture—"Meteorology and Air Pollution," Address by the Minister of Power, Lord Mills, Presidential Address, and papers on the Administration of the Clean Air Act, Industry and the Clean Air Act, and Pollution from Road Vehicles. 12s. 6d. (12s. 11d.)

126. **Llandudno Conference, 1958.** The Des Vœux Memorial Lecture—"Clean Air, Urban Amenity, and the Growth of Towns," Address by the Minister of Housing and Local Government, Presidential Address, Industrial Aspects of the Clean Air Act, Forum on Smoke Control Areas, and papers on Air Pollution in London and its Smokeless Zones, Air Pollution and Respiratory Disease, Hazards from Airborne Radioactive Matter, and An Automatic Stoker for Central Heating. 12s. 6d. (12s. 11d.)

140. **London, 1959: Diamond Jubilee International Clean Air Conference.** Containing Opening Address by Sir Graham Sutton, F.R.S.; 78 Papers on National Air Pollution Problems, Legislation, Education; Technical Problems; Observations, Investigation and Measurement; Research and International Co-operation; Discussions and Authors' Replies. 30s. (32s. 6d.). (Reprints available of some of the Papers).

144. **Harrogate Conference, 1960.** The Des Vœux Memorial Lecture—"Clean Air, Public Opinion and the Press," Address by Parliamentary Secretary, Ministry of Housing and Local Government, Series of progress reports on (1) Research and Investigation; (2) Domestic Heating; (3) Industrial Problems, Papers on Air Pollution from Road Vehicles, and an Inquiry into the Working of the Clean Air Act. 25s. (25s. 8d.)

175. **Brighton Conference, 1961.** Opening Address by John C. George, Parliamentary Secretary, Ministry of Power. Presidential Address by Lord Cohen of Birkenhead. Reports on National Survey of Air Pollution, Furnace Operators Bill, Diesel Smoke; Papers on Industrial Aspects of the Clean Air Act, Whole House Heating, Smoke Control Areas and Transatlantic Discussion. 15s. (15s. 7d.)

214. **Harrogate Conference 1964** Opening Address by the Rt. Hon. Lord Sherfield. Presidential Address by Dr. Albert Parker. Smoke Control Area Reports from 8 regions; two papers on Air Pollution and Town Planning, four papers on the future supply of smokeless fuels; Des Vœux Memorial Lecture—"A Century of Achievement"; a paper on road vehicle pollution and discussion on the Sulphur Dioxide Report. 25s. (25s. 6d.)

230. **Eastbourne Conference 1965.** Opening Address by John Morris, M.P., Parliamentary Secretary, Ministry of Power. Presidential Address by Sir Alan Wilson, F.R.S. Three Reports on Successes with Smoke Control; two papers on solid fuel distribution and supply problem; air pollution and mortality; odour control; control of pollution from road vehicles; four papers on new horizons in domestic heating; two papers on industrial problems; two papers on unresolved problems in air pollution. 25s. (25s. 6d.)

272. **Blackpool Conference 1967.** Opening Address by Stephen Swingler, M.P., Ministry of State, Ministry of Transport, Presidential Address by Sir John Charrington. Report on Air Pollution from road vehicles; some specific air pollution problems; Clean Air and the North West Environment; two papers on effects of pollution on environment; Des Vœux Memorial lecture—"Clean Air and Future Energy"; a paper on the emission of grit and dust from furnaces; the cost of smoke control; a report on smokeless heating in new housing; industrial and municipal incineration of refuse; paper on new oxygen-fuel process in steelmaking. 30s. (30s. 7d.)

International Clean Air Congress, London, 1966

239. **Proceedings: Part I** (In English, French and German) 91 papers from 20 countries. World review, domestic, other space heating and town planning, industrial problems; fumes and gases, research and investigations; standards and regulations, legislation and international co-operation. 40s. (postage and packing extra)

240. **Proceedings:** Part II Reports of the sessional Rapporteurs, discussions on the Papers, replies by the Authors; remarks of the Chairmen and Vice-Chairmen. (Out of Print)

Reprints:

Des Vœux Memorial Lectures

45. **Towards the Better Use of Coal.** Dr. D. T. A. Townend, 1950. 2s. 6d. (2s. 9d.)

78. **The Destructive Effects of Air Pollution on Materials.** Dr. A. Parker. 1955. 1s. (1s. 3d.)

102. **Meteorology and Air Pollution.** Sir Graham Sutton, 1957. 1s. (1s. 3d.)

130. **Clean Air, Urban Amenity and the Growth of Towns.** Sir William Holford, 1958. 1s. (1s. 3d.)

214. **A Century of Achievement.** J. S. Carter, 1964. (In Proceedings of 1964 Harrogate Conference and *Smokeless Air* No. 132, Winter, 1964).

152. **Clean Air, Public Opinion and the Press.** Sir Linton Andrews, 1960. (Advance Proofs only). 9d. (1s.)

273. **Clean Air and Future Energy.** Dr. E. F. Schumacher. 1s. (1s. 3d.)

Other Reprints

145. **Some factors concerning Diesel Engine Exhaust Fumes.** J. K. Lock, 1960. 1s. (1s. 3d.)

146. **Methods of Removing Smoke from Road Vehicles.** L. E. Reed and S. C. Wallin, 1960. 1s. (1s. 3d.)

147. **Sampling for 3:4 Benzpyrene in Flue Gas from Plant fired by Petroleum Fuels.** E. L. Howe, 1960. 1s. (1s. 3d.)

148. **Trends in the Pollution of the Air of Gt. Britain, 1952-59.** J. Carroll, S. R. Craxford, H. E. Newall, P. M. Weatherley, 1960. 1s. 3d. (1s. 6d.)

149. **Pollution Levels in Cities.** F. P. Williams, 1960. 1s. (1s. 3d.)

150. **Accuracy and Reliability of Instruments in Common Use for Measurement of Air Pollution.** S. R. Craxford, E. T. Wilkins, D. W. Slimming, 1960. 1s. (1s. 3d.)

165. **Air Pollution from Road Vehicles.** Reprint of Papers and Discussions, 1960. 3s. (3s. 3d.)

185. **Mitigation of Air Pollution at Coking Plants.** R. L. Cooper and J. P. Graham, 1962. 1s. (1s. 3d.)

186. **Incineration and Waste Disposal.** S. Cayton. 1962. 1s. (1s. 3d.)

215. **Power Stations and Clean Air.** G. N. Stone and A. J. Clarke. 1963. 1s. (1s. 3d.)

231. **Solid Fuel Distribution and Supply Problems.** W. H. Bourne, 1965.

232. **Odour Control by Catalytic Combustion.** E. Betz, 1965.

274. **Corrosion by Air Pollution: A Review.** J. R. Goss, 1967. 1s. (1s. 3d.)

275. **Industrial and Municipal Incineration of Refuse.** E. J. Ostle. 1967. 3s. (3s. 3d.)

276. **Some Mineralogical Aspects of Air Pollution Damage to Limestone.** K. J. Henley. 1967. 1s. (1s. 3d.)

277. **Presidential Address** by Sir John Charrington, 1967.

Reprints of International Congress, London, 1966, Papers

The following papers only are available, in limited quantity. Price 2s. 6d. each, including postage.

241. **Herkunft und Ausbreitung von Luftverunreinigungen, Ermittelt durch Stationäre Registrierung Mehrerer Immissionskomponenten.** Breuer W. und Winkler K.

242. **Study of the Effect of Air Pollution Upon Respiratory Diseases in London in the Winters of 1962-63 and 1963-64.** S. J. Carne.

278. **Collection of Dust from Refuse Incinerators in Electrostatic Precipitators Provided with Multicyclone After-Collectors.** C. Cederholm.

243. **Pollution de L'Atmosphère De Paris par Les Gaz D'Echappement des Véhicles Automobiles.**
Mesure Des Niveaux Et Premiers Remèdes Envisagés. P. Chovin and R. Thiebault.

244. **Alleviation of Air Pollution in the Coking Industry.** R. L. Cooper, and G. W. Lee.

245. **Smoke and Sulphur Dioxide in Great Britain: Distribution and Changes.** S. R. Craxford, Marjorie Clifton and Marie-Louise P. M. Weatherly.

246. **Konzentrationsbestimmungen Teilchen förmiger: Luftverunreinigungen im Ruhrgebiet.** K. H. Friedrichs und A. Brockhaus.

247. **The Working Party on Air Pollution—European Federation of Chemical Engineering.** D. Gall.

248. **Die Vertikalverteilung des Kohlenmonoxid in Grosstadstrassen in Abhängigkeit von den Meteorologischen Bedingungen.** Hans-Walter Georgii.

249. **Sulphur Dioxide Concentrations Measured around a Modern Power Station.** E. W. F. Gillham, A. Martin and F. R. Barber.

250. **Oil Burners for Domestic Application; Present Design and Future Developements.** B. Gills and E. L. Howe.

251. **Calculated Versus Continuously Measured SO_2 Concentrations with Regard to Minimum Stack Heights and Urban Renewal** (urbanisme). K. Gräfe.

252. **Tomorrow's Town Transport—The Advantages of Electric Traction.** A. N. Irens.

253. **Verfahren zur Verminderung der durch Die Zementindustrien Verursachten Luftverunreinigungen.** W. Köhler.

254. **Sub-Minute Continuous Nitrogen Dioxide Analysis.** E. L. Kothny and P. K. Mueller.

255. **Determining Source Reduction Needed to Meet Air Quality Standards.** Ralph I. Larsen.

256. **Progress in Air Pollution Control in South Africa.** C. E. Latsky and E. C. Halliday.

279. **Collection of Dust from Oil-Fired Boilers in Multi-Cyclones and Electrostatic Precipitators.** S. Maartman.

258. **Tree Belts as a Protection against the Harmattan in Nigeria.** B. A. Molski.

259. **Towards Cleaner Diesel Engine Exhausts.** R. E. Pegg and A. W. Ramsden.

280. **The Role of Gas in the Reduction of Air Pollution.** F. F. Robb.

281. **Air Pollution Monitoring in Canada.** C. R. Ross and H. J. Wilson.

260. **International Dust and Fume Collection Problems.** G. G. Schneider.

282. **Pioneering Experience with High Stacks on the Ovec and American Electric Power Systems.** P. Sporn and T. T. Frankenberg.

283. **Studies on Automatic Recording Apparatus for Measurements of Oxidants in Air.** S. Suzuki.

Miscellaneous

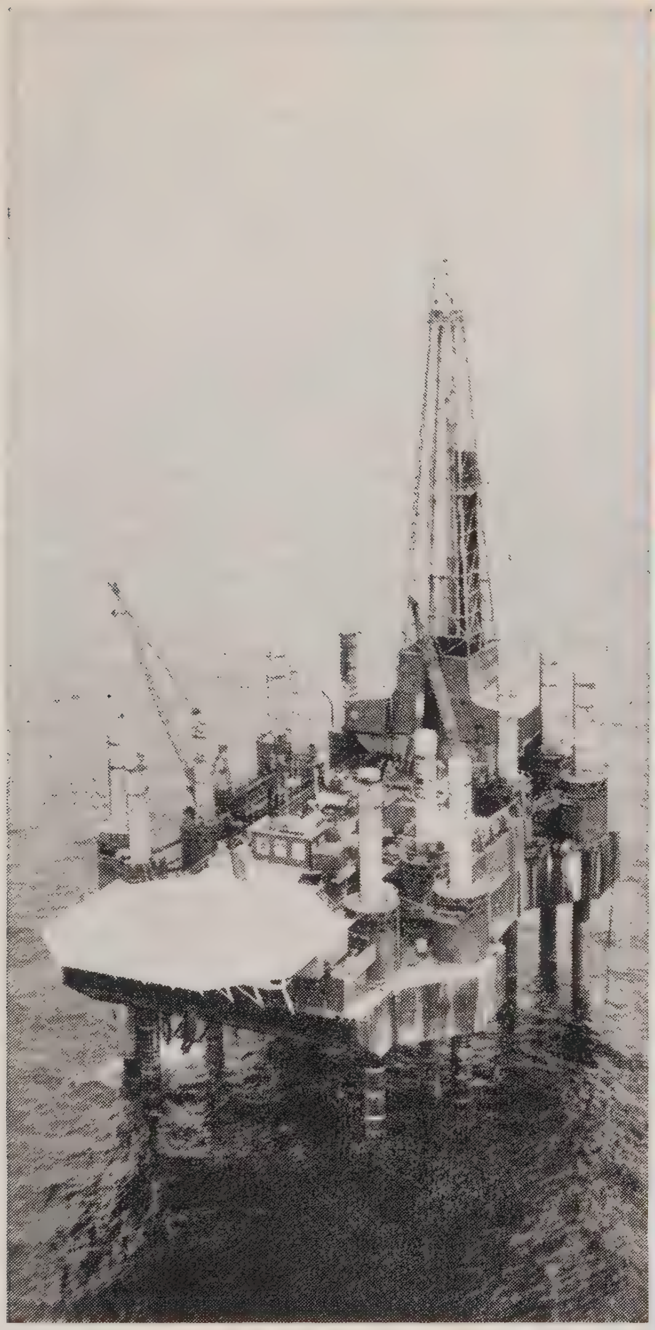
93. **Ringelmann Smoke Chart** (with instructional leaflet). Chart for measuring smoke density. (Charles Griffin & Co. Ltd.)
1s. 2d. each, 3 for 2s. 6d., 6 for 4s. 2d., 12 for 7s. 2d., including postage.

112. **'Power's' Microringelmann.** Direct facsimile reduction of the standard Ringelmann Chart (McGraw-Hill). Single copies, 2s. 6d. (2s. 9d.) 27s. 6d. per dozen, post free.

217. **Sulphur Dioxide.** An Examination of Sulphur Dioxide as an Air Pollutant by the Technical Committee of the Nat. Soc. for Clean Air. 2s. (2s. 3d.)

218. **Clean Air.** Notes for Teachers and Lecturers. Nat. Soc. for Clean Air. 1s. 6d. (post free)
Clean Air Wall Chart (with Notes for Teachers, as above). From Educational Productions Ltd., 17 Denbigh Street, London, S.W.1. 2s.

Air Pollution from Motor Vehicles. A Report by the Technical Committee of the Nat. Soc. for Clean Air. 3s. (3s. 3d.)



Above: Mr. Louie, the North Sea drilling rig which discovered gas for the Gas Council—Amoco Group.

Rich reserves of natural gas under the North Sea will transform the future for Britain's fast developing Gas Industry. Already the exploitation of new manufacturing techniques based on oil and the scheme for importing methane from North Africa have given the industry an entirely new look. Together, these advances promise ample supplies of gas at increasingly competitive prices.

High Speed Gas for clean air zones

Domestic heating is the most important consideration when a district becomes a Smoke Control Area.
Consider the advantages of gas. Most homes use gas for cooking. A clean, smokeless fuel is on tap. The installation of radiant-convector gas fires providing automatic, efficient, labour-free heating is a simple matter. They are as cheap to run as traditional fires and because tariffs improve as more gas is used, the householder gains additional economies. Gas appliance sales are booming, particularly those for heating the home. The public wants this clean, convenient, economical fuel. It is the ideal answer to smoke control problems. Gas Boards offer a comprehensive service and have helped many local authorities with advice on clean air conversions. The Commercial Manager of your Gas Board would be pleased to help you.

HIGH SPEED GAS

Films and Filmstrips

Following is a list of films and filmstrips on air pollution and its prevention, fuel efficiency, etc. Application for the loan of the films (or purchase of the filmstrips) should be made to the issuing organization, referred to in the list by its initials, the key to which is given at the end of the list. Most of the films are available free. 2-3 weeks advance notice of hire should be given. The running time in minutes is shown. Unless otherwise indicated, the films are available in both 16 and 35 mm. sizes, with sound.

The Society welcomes information on other films suitable for inclusion in future editions of the Year Book.

Films

GENERAL AND EDUCATIONAL

Family Album. The problems of domestic life confronting successive generations of a middle-class family from 1851-1965. 30 mins. G.C.

The First Mile Up. The experience of cities in North America making vigorous efforts to combat air pollution. Smoke prevention in Toronto. Particularly well illustrated. 16 mm. 28 mins. C.H.F.L.

DOMESTIC AND SMOKE CONTROL AREAS

Window to the Sky. Excellent colour film, showing technique of setting up smoke control area. Suitable for general publicity, and for showing to members of local authorities. 16 mins. G.C.

Clean Air. Colour film dealing with air pollution and showing how modern methods of domestic heating meet the requirements of the Clean Air Act. 22 mins. S-M & B.P. Ltd.

French Architecture and Modern Heating. Modern solid fuel heating systems in a wide range of applications to buildings all over France are featured in this colour film which has been adapted in English by the N.C.B. Film Unit. 27 mins. N.C.B.

People Like Us. An amusing colour film about solid fuel home-heating. N.C.B.

Report from America: Smog. Concerted action by the inhabitants of Pittsburgh, Pennsylvania, at one time gravely affected by industrial and domestic air pollution, has eventually rid the city of lethal "smog" and ensured a pure atmosphere. This film gives an account of their campaign. 30 mins. C.F.L.

Housewarming. "The Bartons" decide to install solid smokeless fuel central heating. 17 mins. N.C.B. (In colour.)

It Takes Your Breath Away. A review of the causes of "dirty air" as produced by domestic and industrial smoke, traffic, etc. The effect on the lungs of living in this type of atmosphere is briefly shown and the film is of value to Public Health Workers as a means of ramming home the ill effects of a smoky atmosphere. 16 mm. 10 mins. B.M.A.

Gas in Modern Housing. Stresses the need to incorporate clean air principles in new house design. 16mm. 18 mins. G.C.

Project—Halton Fields. Features a modern housing estate where developers have used domestic oil fired central heating on a district level. Colour. 20 mins. S-M & B.P.

Group Heating in Paisley. District Heating claims great advantages over the more conventional domestic heating particularly in new development areas as shown in this study of urban renewal in Paisley. Colour. 7 mins. N.C.B.

Leicester District Heating. Similar theme to the above but a more ambitious and extensive project. Colour. 10 mins. N.C.B.

Welcome Home. The case histories of three householders in newly created smokeless zones in Sheffield. The range of solid smokeless fuels and heating appliances available is fully covered. Colour. 26 mins. N.C.B.

FUEL, POWER AND INDUSTRIAL

Fluidized Coal Carbonization and Hot Briquetting. To provide sufficient smokeless fuels to meet the increasing demand, the N.C.B. Coal Research Establishment has developed a new smokeless fuel. 12 mins. N.C.B.

Homefire. Smokeless fuel for the open fire. Based on small-sized smoky coal the new smokeless fuel is now in quantity production at Birch Coppice. The manufacture of the briquettes is explained non-technically. 12 mins. N.C.B. (In colour.)

Using the Coal. Shows various uses of coal, and its place among modern sources of energy. 37 mins. 16 mm. only. N.C.B.

Mechanical Firing of Coal. A group of six colour films presenting the main types of mechanical stoker. Total length 60 mins. N.C.B.

Coal: Our Wasting Asset. This film deals with fuel efficiency, fuel conservation and the problem of smoke. 10 mins. N.C.B.

Saharan Venture. Methane gas from the Sahara is helping to provide Britain with abundant supplies of clean fuel. This film tells the story of the venture in colour. 28 mins. G.C.

The Methane Story. A longer version of the above film made for the benefit of specialists. Emphasizes the methods and techniques employed. Colour, 16 mm. 45 mins. G.C.

Clearing the Air. In many districts much more remains to be done if the Act is to be effective. This film shows the contribution of the Gas Industry to progress. Colour. 12 mins. G.C.

Oil Fuel Combustion. Shows effects of bad firing and inefficient fuel combustion. Set in a destroyer at sea. 29 mins. 16 mm. only, silent. C.F.L.

Power in Trust. Electricity plays an important role in all our lives. Through the eyes of a schoolboy the generation of electricity in a modern power station is explained. Colour, 15 minutes. M.R., C.E.G.B.

Burning Your Fuel. Shows how simply heat is lost, and methods of prevention. 10 mins. 16 mm. only. N.I.F.E.S.

Firing Your Fuel. Mechanical firing for solid smokeless fuels. 8 mins. 16 mm. only. N.I.F.E.S.

Atomization. Discusses the technical aspects of combustion of oil fuels. 17 mins. S-M & B.P. Ltd.

Combustion and the Chain Grate Stoker. Shows chemical and physical principles of coal, combustion, and their application in chain grate stoker. 25 mins. B. & W.

Pulverized Fuel. Deals with principles of pulverized fuel use. 40 mins. B. & W.

This Age of Steam. The film emphasizes the growth of world population, rising industrialization and improving standards of living, which result in a rapidly increasing demand for power, chiefly electrical power. 16 mm. Colour, 35 mm. B. & W.

Industrial Electric Heating. Colour film on the use of electricity for industrial heating processes. 30 mins. E.C.

You and Your Fuel. This film attempts to show the many variations in the quality of coal, due to natural causes and why all the dirt and water cannot be removed before the coal is delivered to the customer. 16 mm. only. N.I.F.E.S.

You and Your Diesel. The importance of maintenance for diesel-engined lorries and tractors. In colour. 35 mins. S-M. & B.P. Ltd.

Combustion. An instructional film for service engineers and boilerhouse staff. 30 mins. H.B.

Steam and Steam Generation. Film deals with the properties of steam, early boiler design and the modern steam generator design. Colour. 16 mm. Sound. 31 mins. (International Combustion Ltd.) C.F.L.

Running the Low Ram Stoker. Shows the operational technique for the Low Ram Cooking Stoker. 16 mm. 25 mins. H.B.

Synchromatic. Deals with a new revolutionary under feed stoker showing the working in detail. Colour. 16mm. 8 mins. H.B.

Gas Flow. Research into the effects of various types of flue baffles and bridge heights. 16 mm. 7 mins. H.B.

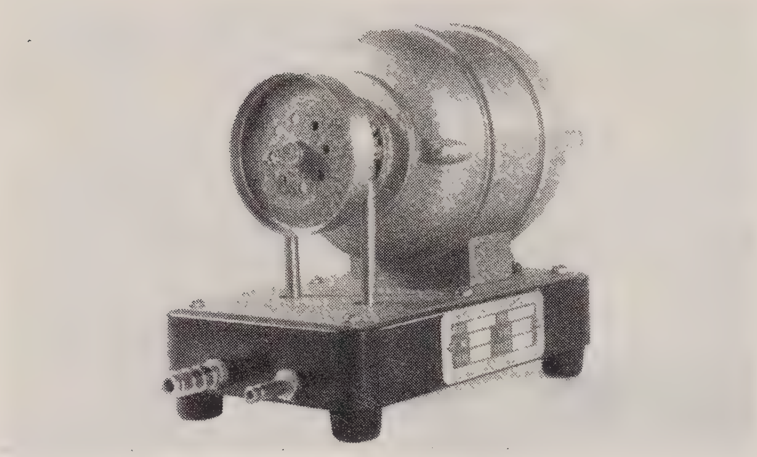
Air Flow. Experiments on the hydraulic flow model applied to the Chain Grate stoker. 16 mm. 9 mins. H.B.

Steambloc a Packaged Deal. Describes a widely used packaged boiler which is both clean and efficient in operation. Colour. 16 mm. Sound. 14½ mins. S.B.C.

The Properties of Coal. Explains difference between various coal gradings. Explanation of swelling number. 16 mm. 18 mins. H.B.

Sea Born Treasure. The purpose of this film is to touch upon the connection between the discovery of gas in the North Sea and the effect its distribution may be expected to have on the national economy and the citizen. 16 mm. Colour, 25 mins. G.C.

ATMOSPHERIC POLLUTION
SAMPLING PUMPS



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Key to Issuing Organizations:

B.M.A.—British Medical Association, Film Library, Tavistock Square, London, W.C.1.

B. & W.—Babcock & Wilcox Ltd., Babcock House, 209 Euston Road, London, N.W.1.

C.F.L.—Central Film Library, Government Buildings, Bromyard Avenue, Acton, London, W.3.

C.H.F.L.—Canada House Film Library, 1 Trafalgar Square, London, S.W.1.

E.C.—The Electricity Council, EDA Division, Trafalgar Buildings, 1 Charing Cross, London, S.W.1.

G.C.—The Gas Council, Hyde Park House, 4-5 Grosvenor Place, London, S.W.1.

*H.B.—Hodgkinson Bennis Ltd., Little Hulton, Worsley, Manchester.

M.R., C.E.G.B.—Public Relations, Midlands Region, C.E.G.B., Haslucks Green Road, Shirley, Solihull, Warwickshire.

N.C.B.—National Coal Board, Film Department, 26-28 Dorset Square, London, N.W.1.

N.F.B.C.—National Film Board of Canada, 1 Grosvenor Square, London, W.1.

N.I.F.E.S.—National Industrial Fuel Efficiency Service, 71/72 Grosvenor Street, London, W.1.

S-M & B.P. Ltd.—Shell-Mex and B.P. Film Library, 25 The Burroughs, Hendon, London, N.W.4.

SBC—Spencer Bonecourt Clarkson Ltd., Easton Street, Roseberry Avenue, London, S.E.1.

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* Hire Charge of £1 per film.

Film Strips

Air Pollution and You. Colour. Traces sources of air pollution and illustrates methods of control in 31 captioned frames. (Produced by Current Affairs Films of New York.) Available, *on loan*, from the Society free of charge to Members. A charge of 3s. 6d. for postage and packing will be made to non-members.

Air Pollution. Black and white. Prepared in consultation with Association of Public Health Inspectors. General survey of problem, methods of measurement, etc. (prepared by Camera Talks). Available from Society, complete with lecture notes, price 2 guineas. (Quote Ref. No. CT.58). Also **The Public Health Inspector.** Colour. £2 12s. 6d. (Quote Ref. No. CT.24).

The Role of Industry. Colour. Deals with the general problem, illustrates plant and appliances for preventing smoke and grit. (Prepared by Camera Talks in conjunction with Association of Public Health Inspectors). Available from Society, complete with lecture notes, £2 12s. 6d.

Smoke Control Areas. Colour. Deals with setting up of smoke control areas. Suitable for general public, officers and members of local authorities. (Prepared by Camera Talks in conjunction with Association of Public Health Inspectors). Available from Society, complete with lecture notes, £2 12s. 6d.

Air Pollution. (A) Its nature, production and effects, and (B) its dispersion and accumulation. Two film strips in colour, each containing 32 frames. Script by R. S. Scorer, PH.D. Foreword by Sir Hugh Beaver. (Prepared by Diana Wyllie Ltd.). Available from Society, price £4 the pair. (Quote Ref. No. DW.F.22/23).

Chronic Bronchitis. Colour. Shows effects of Air Pollution in causation of Bronchitis. Lecture notes by Dr. J. L. Burn, with Appendix on Air Pollution. (Diana Wyllie Ltd., in co-operation with Pfizer Ltd.). Available from the Society, price £2.

Good-Bye Smog. An illustrated talk using a series of 2 in. x 2 in. slides; covers all aspects of the Clean Air Act and gives valuable advice on fuels, grants and appliances. Inquiries to:- The Women's Advisory Council on Solid Fuel, 18 South Molton Street, London, W.1.

DIRECTORY OF ORGANIZATIONS

with Air Pollution Interests

Great Britain

Alkali Inspectorate:

Chief Inspector, Ministry of Housing and Local Government. Whitehall, London, S.W.1. (01-930 4300 Ext. 76).

Deputy Chief Inspectors, Ministry of Housing and Local Government, Whitehall, London, S.W.1. (01-930 4300 Ext. 54 and 61.)

Chief Inspector for Scotland, Scottish Development Department, 21 Hill Street, Edinburgh, 2. (031-226 5208).

Architects and Surveyors, Incorporated Association of, 29 Belgrave Square, London, S.W.1. (01-235 3755/7).

Architects, Royal Institute of British, 66 Portland Place, London, W.1. (01-580 5533).

Arts, Royal Society of, 6-8 John Adam Street, London, W.C.2. (01-839 2366).

British Industrial Measuring and Control Apparatus Manufacturers' Association, 23/24 Margaret Street, London, W.1. (01-580 9336).

British Ironfounders' Association, 30 St. James's Square, London, S.W.1. (01-930 6866 and 6436) and Fleming House, Renfrew Street, Glasgow, C.3. (041-332 0826-7).

British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1. (01-387 4499).

British Oil & Gas Firing Equipment Manufacturers' Association, Old Boundary House, London Road, Sunningdale, Berks. (Ascot 20294).

British Standards Institution, British Standards House, 2 Park Street, London, W.1. (01-629 9000).

British Steel Castings Research Association, The, East Bank Road, Sheffield, 2. (0742 28647)

British Steel Corporation, 7 Old Park Lane, London, W.1. (01-629 7676).

Building Centre, The, 26 Store Street, London, W.C.1. (01-636 5400).

Cast Iron Research Association, British, Alvechurch, Birmingham. (0739 2 2715).

Central Electricity Generating Board, Sudbury House, 15 Newgate Street, London, E.C.1. (01-248 1202).

Centre for Environmental Studies, 5 Cambridge Terrace, Regent's Park London, N.W.1. (01-486 3956).

Chemical Engineers, Institution of, 16 Belgrave Square, London, S.W.1. (01-235 3647).

Chemistry, Royal Institute of, 30 Russell Square, London, W.C.1. (01-580 3482).

City and Guilds of London Institute, 76 Portland Place, London, W.1. (01-580 3050).

Civic Trust, Walter House, Bedford Street, Strand, London, W.C.2. (01-836 5202).

Civil Engineers, Institution of, Great George Street, London, S.W.1. (01-839 3611).

Clean Air Council, Ministry of Housing and Local Government, Whitehall, London, S.W.1. (01-930 4300 Ext. 345).

Clean Air Council for Scotland, Scottish Development Department, 21 Hill Street, Edinburgh, 2. (031-226 5208).

Clean Air, National Society for:

Central Offices: Field House, Breams Buildings, London, E.C.4. (01-242 5038).

East Midlands Division: Health Department, Town Hall, Chesterfield. (0246 77232).

North-East Division: Health and Social Services Department, Civic Centre, Barras Bridge, Newcastle-upon-Tyne, 1. (0632 28520).

North-West Division: Health Centre, Salford, Lancs. (061-736 5891, Ext. 263).

Northern Ireland Division: Public Health Department, 414 Ormeau Road, Belfast, 7. (0232 642905).

Scottish Division: 73 John Street, Glasgow. (041-221 9600. Ext. 2425).

South East Division: Public Health Department, Drayton Hall, West Drayton, Middx. (WE3 2275).

South Wales and Monmouthshire Division: 9 Lodge Drive, Baglan, Port Talbot, Glam. (0639 6 2244 Ext. 45).

South West Division: St. Clement's House, Marsh Street, Bristol, 1. (0272 26241).

West Midlands Division: Public Health Inspector's Office, Municipal Buildings, (Cradley Heath, Warley, Worcs. 0384 66891).

Yorkshire Division: Public Health Department, 12 Market Buildings, Vicar Lane, Leeds, 1. (0532 30211. Ext. 29).

Coal Board, National, Hobart House, Grosvenor Place, London, S.W.1. (01-235 2020).

Coal Utilisation Council, 19 Rochester Row, London, S.W.1. (01-834 2339).

Coal Utilisation Research Association, British, Randalls Road, Leatherhead, Surrey (537 4411).

Coke Distributors' Associations, National Federation of, Terminal House, 52 Grosvenor Gardens, London, S.W.1. (01-730 6120).

Area Offices:

London and Counties C.D.A.: Terminal House, 52 Grosvenor Gardens, London, S.W.1. (01-730 6129).

Midland Counties C.D.A.: Fuel House, 12 George Road, Edgbaston, Birmingham, 15. (021-454 8225).

Northern C.D.A.: 54/55 Bondgate, Darlington, Co. Durham. (0325 2832).

North Eastern C.D.A.: West Bar Chambers, 38 Boar Lane, Leeds, 1. (0532 33361).

Wales C.D.A.: 4 Dock Chambers, Bute Street, Cardiff. (0222 29649).

Lancashire and District C.D.A.: Whitworth House, 115 Princess Street, Manchester, 1. (061-236 3437).

Coke Oven Managers' Association, 1 Cliff Street, Mexborough, Yorks.

Coke Research Association, British, Chesterfield, Derbys. (Chesterfield 76821).

Combustion Engineering Association, Trident House, Station Road, Hayes, Middlesex. (01-573 1393 and 2967).

Confederation of British Industry, 21 Tothill Street, London, S.W.1. (01-930 6711).

Corrosion Technology, Institution of, 33 Ovington Square, London, S.W.3. (01-589 9649).

Council for the Protection of Rural Wales, (Cymdeithas Diogelu Harddwch Cymru), Meifod, Montgomeryshire. (Meifod 383).

County Boroughs' Association, Guildhall, Kingston upon Hull. (Kingston upon Hull 36880).

County Councils Association, Eaton House, 66A Eaton Square, London, S.W.1. (01-235 5173).

County Councils in Scotland, Association of, 3 Forres Street, Edinburgh. (031-225 1626/7).

Derbyshire Clean Air Joint Consultative Committee, Town Clerk's Office, Town Hall, Chesterfield. (0246 77232).

Domestic Heating Society, Norwich House, 58/62 High Street, Epsom, Surrey.

Domestic Solid Fuel Appliances Approval Council, 4-5 Grosvenor Place, London, S.W.1. (01-235 4321).

Electrical Association for Women, 25 Foubert's Place, London, W.1. (01-437 5212).

Electrical Engineers, Institution of, Savoy Place, London, W.C.2. (01-240 1871).

Electrical Research Association: Offices, Library and Laboratories, Cleeve Road, Leatherhead, Surrey. (537 4151).

Electricity Council, 30 Millbank, London, S.W.1. (01-834 2333).

Forest Products Research Laboratory, (Ministry of Technology), Princes Risborough, Aylesbury, Bucks. (Princes Risborough 101-2).

Fuel, Institute of, 18 Devonshire Street, London, W.1. (01-580 7124).

Fuel Technology, College of, 90 Talbot Road, Highgate, London, N.6. (01-340 6972).

Gas Council, 59 Bryanston Street, Marble Arch, London, W.1. (01-723 7030).

Gas Engineers, Institution of, 17 Grosvenor Crescent, London, S.W.1. (01-245 9811).

Gas Industries, Society of British, 16 Grosvenor Crescent, London, S.W.1. (01-235 5632 and 3940).

Great Britain, Royal Institution of, 21 Albemarle Street, London, W.1. (01-493 5716).

Health Education, Central Council for, Tavistock House, North Tavistock Square, London, W.C.1. (01-387 3341).

Health, Ministry of, Alexander Fleming House, Elephant and Castle, London, S.E.1. (01-407 5522).

Health, Royal Society of, 90 Buckingham Palace Road, London, S.W.1. (01-703 5134).

Heating and Ventilating Engineers, Institution of, 49 Cadogan Square, London, S.W.1. (01-235 7671/2/3).

Hospital Engineering, Institute of, 20 Landport Terrace, Southsea, Hampshire. (Portsmouth 23186).

Housing and Local Government, Ministry of, Whitehall, London, S.W.1. (01-930 4300). (*See also Alkali Inspectorate*).

Housing Centre Trust, 13 Suffolk Street, London, S.W.1. (01-930 2881).

Independent Steel Producers' Association, British, Steel House, Tothill Street, London, S.W.1. (01-930 1030).

Institute for Conservation of Historic & Artistic Works, International, National Gallery, London, W.C.2. (01-930 1665).

Institute of Housing Managers, Victoria House, Southampton Row, London, W.C.1. (01-242 3267/8).

Iron Council, Joint, 14 Pall Mall, London, S.W.1. (01-930 7171).

Iron and Steel Research Association, British, 24 Buckingham Gate, London, S.W.1. (01-828 7931).

London and Home Counties Clean Air Advisory Council, Health Department, City Hall, Victoria Street, London, S.W.1. (01-828 8070. Ext. 437).

London Boroughs Association, Westminster City Hall, Victoria Street, London, S.W.1. (01-828 8070).

Low Temperature Coal Distillers' Association of Great Britain Ltd., P.O. Box No. 21, Chesterfield, Derbyshire. (0246 82 2281/9).

Manchester and District Regional Clean Air Council, Town Hall, Manchester, 2. (061-236 3377, Ext. 341).

Mechanical Engineers, Institution of, 1 Birdcage Walk, London, S.W.1. (01-930 7476).

Medical Officers of Health, The Society of, Tavistock House South, Tavistock Square, London, W.C.1. (01-387 3923).

Medical Research Council, Air Pollution Research Unit, St. Bartholomew's Hospital Medical College, Charterhouse Square, London, E.C.1. (01-253 1537).

Meteorological Office, London Road, Bracknell, Berkshire. (0344 20242).

Meteorological Office, Weather Centres:
Forecasts, London: 01-836 4311.
Glasgow: 041-248 3451.
Manchester: 061-832 6701.
Newcastle: 0632 26453.
Southampton: 0703 28844.

Meteorological Society, Royal, 49 Cromwell Road, London, S.W.7. (01-589 0730).

Midlands Joint Advisory Council for Clean Air and Noise Control, The Limes, Dudley Road, Sedgley, Staffs.

Municipal Corporations, Association of, 36 Old Queen Street, Westminster, London, S.W.1. (01-930 9861).

Municipal Engineers, Institution of, 25 Eccleston Square, London, S.W.1. (01-834 5082/3).

National Housing and Town Planning Council Incorporated, 11 Green Street, London, W.1. (01-629 7107/8).

National Industrial Fuel Efficiency Service, 71 Grosvenor Street, London, W.1. (01-493 9706).
Area Offices:
North Eastern: St. Paul's House, 20/22 St. Paul's Street, Leeds, 1. (0532 20046).
44A Great North Road, Newcastle upon Tyne. NE2 4HA. (0632 813776).
London and South Eastern: 24 Bruton Place, London, W.1. (01-493 7687).
8 Queen Anne Terrace, Gonville Place, Cambridge. (0223 56271).
Wales and South Western: Baltic House, Mountstuart Square, Cardiff, CF1 6DH. (0222 33825).
West Midlands: 26 Calthorpe Road, Edgbaston, Birmingham, 15. 021-EDG-4471.
East Midlands: Wellington House, 190 Derby Road, Nottingham, NG7 1NR. (0602 44753).
North Western: 89 Oxford Street, Manchester, 1. (061-CEN-9228).
Scotland: 6 Park Terrace, Glasgow, C.3. (041-DOU 2453).
49 Meadowside, Dundee. (0382 22179).
Northern Ireland: 412 Antim Road, Belfast 15 BT15 5GA. (0232 76246).

National Trust for Places of Historic Interest or Natural Beauty, 42 Queen Anne's Gate. London, S.W.1. (01-930 0211).

Parliamentary and Scientific Committee, 7 Buckingham Gate, London, S.W.1. (01-834 2608).

Petroleum, Institute of, Atmospheric Pollution Committee, 61 New Cavendish Street, London, W.1. (01-580 3583).

Power, Ministry of, Thames House South, Millbank, London, S.W.1. (01-222 7000).

Preservation of Rural England, Council for the, 4 Hobart Place, London, S.W.1. (01-235 4771).

Protection of Ancient Buildings, Society for the, 55 Great Ormond Street, London, W.C.1. (01-405 2646).

Public Health and Hygiene, Royal Institute of, 28 Portland Place, London, W.1. (01-580 2731/2).

Public Health Engineers, Institution of 32 Eccleston Square, London, S.W.1. (01-834 3017).

Public Health Inspectors, Association of, 19 Grosvenor Place, London, S.W.1. (01-235 5158/9).

Road Transport Engineers, The Institute of, 1 Cromwell Place, Kensington, London, S.W.7. (01-589 3744).

Royal Institution of Great Britain, 21 Albemarle Street, London, W.1. (01-493 0669 and 5716).

Rural District Councils Association, 147 Victoria Street, Westminster, London, S.W.1. (01-828 7425/8).

Sanitary Association of Scotland, Royal, 150 St. Vincent Street, Glasgow. (041-221 6606).

Scottish Counties of Cities Association, City Chambers, Edinburgh. (031-225 2424).

Scottish Development Department, 21 Hill Street, Edinburgh, 2. (031-226 5208).

Sheffield and District Clean Air Committee, Town Hall, Sheffield. (0742 26444).

Shell-Mex and B.P. Ltd., Shell-Mex House, Strand, London, W.C.2. (01-836 1234).

Social Service, National Council of, 26 Bedford Square, London, W.C.1. (01-636 4066).

Solid Smokeless Fuels Federation, York House, Empire Way, Wembley, Middlesex. (01-902 5405).

Standing Conference of Co-operating Bodies, Warren Spring Laboratory, (Ministry of Technology), Gunnels Wood Road, Stevenage, Herts. (0438 3388).

Stationery Office, Her Majesty's, Atlantic House. Holborn Viaduct, London, E.C.1. (01-248 9876).

Structural Insulation Association, 32 Queen Anne Street, London, W.1. (01-580 7616).

Technology, Ministry of, Millbank Tower, Millbank, London, S.W.1. (01-834 2255). See also Forest Products Research Laboratory and Warren Spring Laboratory.

Tees-side Clean Air Committee, Town Clerk's Office, Municipal Buildings, Middlesbrough. (0642 45984).

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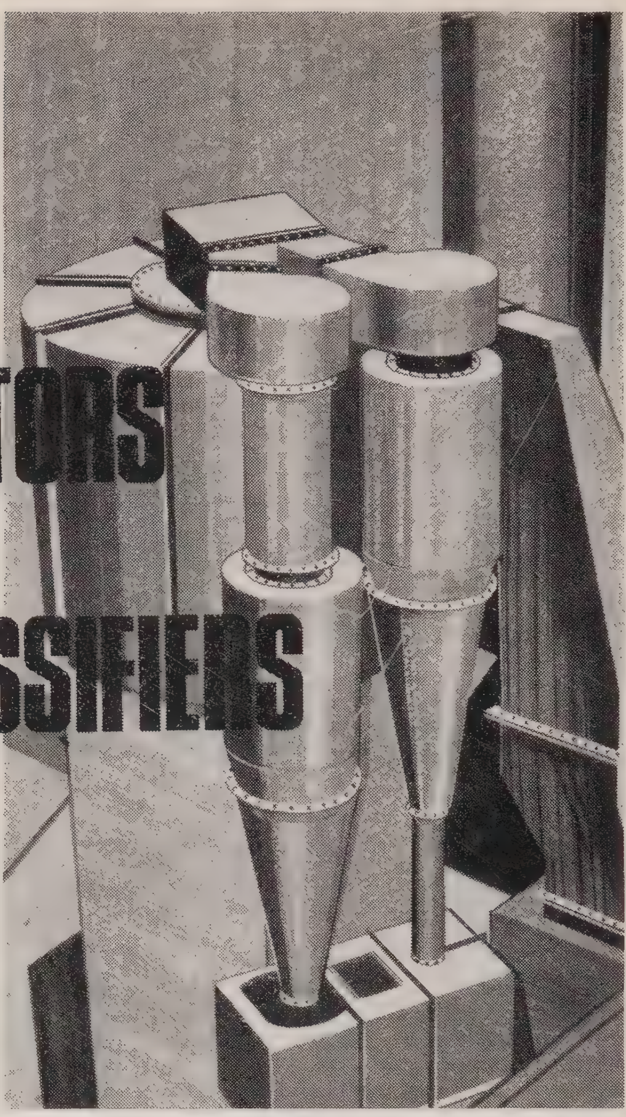

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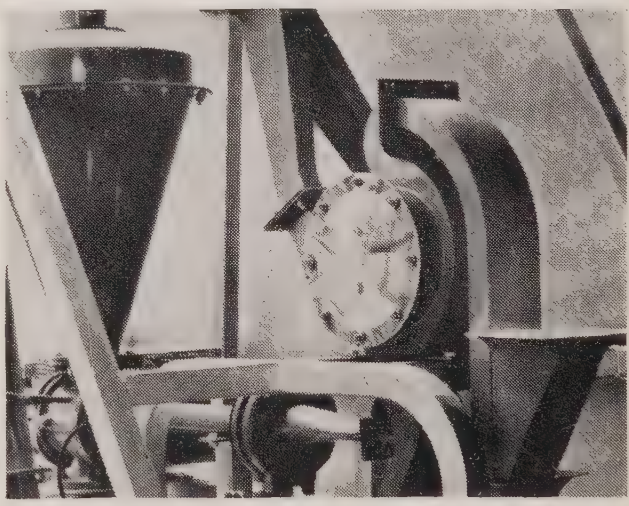

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Town and Country Planning Association, 28 King Street, Covent Garden, London, W.C.2. (01-836 5006).

Town Planning Institute, 26 Portland Place, London, W.1. (01-636 9107/8/9).

Urban District Councils' Association, Palace Chambers, Bridge Street, London, S.W.1. (01-930 4868).

Warren Spring Laboratory, (Ministry of Technology), Gunnels Wood Road, Stevenage, Herts. (0438 3388).

Warwickshire Clean Air Council, Council Offices, Bedworth. (0682 81 3061).

West Bromwich Clean Air Council, C. R. Cresswell, Esq., Secretary, West Bromwich Corporation, P.O. Box No. 40, Town Hall, Lombard Street West, West Bromwich.

West Lancashire and Cheshire Regional Smoke Abatement Committee, c/o Health Department, Hatton Garden, Liverpool, 3. (051-236 8433. Ext. 180).

West Riding Clean Air Advisory Council, Public Health Department, 25 East Parade, Leeds, 1. (0532 30661).

Women of Great Britain, National Council of, 36 Lower Sloane Street, London, S.W.1. (01-730 0619).

Women's Advisory Council on Solid Fuel, The, 18 South Molton Street, London, W.1. (01-629 5358).

Women's Gas Federation and Young Homemakers, 5 Grosvenor Crescent, London, S.W.1. (01-235 4321).

Overseas

Argentine

Asociación Argentina Contra la Contaminación del Aire, Juncal 1699, Buenos Aires.

Australia

Clean Air Society of Australasia, P.O. Box 31, George Street North P.O., Sydney, New South Wales.

Dept. of Public Health, Box 65, Rundle Street, Adelaide, South Australia.

Dept. of Health, George Street, Brisbane, Queensland.

Dept. of Health Services, 24 Campbell Street, Hobart, Tasmania.

Dept. of Health, 316 Queen Street, Melbourne, Victoria.

Dept. of Public Health, 57 Murray Street, Perth, Western Australia.

Dept. of Public Health, N.S.W. Air Pollution Control Branch, 86-88 George Street, Sydney, N.S.W.

Austria

Austrian Society of Industrial Medicine, Kinderspitalgasse 15, Vienna, 9.

Belgium

Centre Scientifique et Technique de la Construction 5 rue de la Violette, Brussels, 1.

Conseil National Contre la Pollution de l'Air, 6, Place de Martyrs, Brussels.

Society of Health and Social Medicine. Secretary: Professor Graffar, Professor of Social Medicine, Liberal University of Brussels.

Cebedair, 2, rue Armand Stévart, Liége.

International Iron and Steel Institute, 5, Place du Champ de Mars, Brussels 5.

Brazil

Associação Brasileira de Prevenção à Poluição do Ar.
Rua Catumb, 318-6° ander, São Paulo, 2.P.7.

Canada

British Columbia Clean Air Association, 2907 West 42nd Avenue, Vancouver 13, B.C.

Dept. of National Health and Welfare. Environmental Assessment Unit Occupational Health Division, 455 Spencer Street, Ottawa 4, Ontario.

Czechoslovakia

Czech Polytechnic University of Prague, Faculty of Mechanical Engineering, Department of Air Engineering, Praha 6, Technická 1902.

Czechoslovak Academy of Sciences, Institut for Physics of the Atmosphere, Praha 4, Spořilov, Boční 11.

Czechoslovak Institut of Physical Chemistry, Department of Physical Chemistry of Aerosols, Praha 2, Máchova 7.

Institut of Hygiene, Praha 10, Srobarova 48.

Power Research Institut, Praha 7, Partizánská 7a.

Research Institut of Air Engineering, Praha 10, Malešice.

Denmark

Cinderkoks Information, Raadhuspladsen 59, Copenhagen 5.

Densk Kedelforening Vesterbrogade I.A., Copenhagen.

National Health Service of Denmark, 1 St. Kongensgade, Copenhagen K.

Finland

Finnish Council for Air Conservation and Noise Abatement, Haartmaninkatu 1, Helsinki 25.

Ministry of Internal Affairs, Aleksanterinkatu 3D, Helsinki.

France

Association pour la Prévention de la Pollution Atmosphérique, M. Yvan Queret, 62 rue de Courcelles, Paris 8.

Association Technique de l'Industrie du Gaz en France, 62, rue de Courcelles, Paris, 8.

Centre d'Information pour le Développement de Conditionnement d'Air, de la Ventilation, du Filtrage de l'Air et du Dépoussierage, 38 rue Copernic, Paris 16.

Centre Interprofessionnel Technique d' Études de la Pollution Atmosphérique (C.I.T.E.P.A.), 28 rue de la Source, 75 - Paris (XVI^e).

Charbonnages de France, 9 Avenue Percier, Paris 8.

Delégation Génerale à la Recherche Scientifique et Technique, 103 rue de l' Université, Paris - 7.

Electricité de France, 11 bis, rue d' Aguesseau, Paris 8.

Institut National d'Hygiène, 11 bis rue de Milan, Paris 9.

Institut Français des Combustibles et de l'Energie, 3 rue Henri Heine, Paris 16.

Institut National de Recherche Chimique Appliquée, 12 Quai Henri IV, Paris 4.

Laboratoire Municipal de la Préfecture de Police, 39 bis rue de Dantzig, Paris 15.

Societé Française des Pétroles BP, 21 rue de a Bienfaisance, Paris 8.

Union Européenne de Medicine Sociale, 1 rue de Courcelles, Paris 9.

Germany

Abgasprüfstelle der DDR, Rudower Chausee 6, 1199 Berlin - Aldershof.

Agrikulturchemisches Institut, Heiligenhaus Bez, Am Vogelsang 14, Düsseldorf.

Bundesministerium für Gesundheitswesen, Michaelstr 10, Bad Godesberg.

Deutsche Gesellschaft für Mineralölwissenschaft und Kohlechemie e.V. Mittelweg 180, Hamburg 13.

Deutscher Stadtetag, Lindenallee 11, Köln-Marienburg.

Deutscher Verein von Gas-und Wasserfachmännern. Beethovenstr. 17, Frankfurt (Main).
Federal Ministry of Health, Michaelstr. 10. 532 Bad Godesberg.
Gaswärme-Institut Essen e.V. Holbeckshof, Essen-Steele 43.
Hygienisches-Institut, Neuer Kamp 25, Hamburg 6.
Hygiene-Institut de Humboldt-Universität, Otto-Grotewohl-Str. 1. 108 Berlin.
Institut fur Gewerbliche Wasserwirtschaft und Luftreinhaltung, Hohenzollernring 38-40, 5000 KÖLN.
Institut für Grubensicherheit und Arbeitsschutz, Kirchgasse 11, Freiberg/Sa.
Institut für Technische Physik der Frauenhofer-Gesellschaft, Königstr 70/74, Stuttgart-Degerloch. Dr.-Ing. Reiher, Director.
Institut für Wasser, Boden und Lufthygiene Corrensplatz 1, Berlin 33.
International Union for Conservation of Life (IUCL).
Secretary: Institut für Biologie und Lebensschutz, D 6229 Schlangenbad—Georganhorn.
Landesinstitut für Arbeitsschutz und Arbeitsmedizin, Kaiserallee 61, 75 Karlsruhe.
Landesanstalt für Bodennutzungsschutz des Landes Nordrhein-Westfalen, 4300 Essen, Eststr. 160.
Ruhrkohlen-Beratung GmbH, Frau-Bertha-Krupp-Str. 4, Essen.
Staubforschungsinstitut des Hauptverbandes der Gewerblichen Berufsgenossenschaften e.V. Langwartweg 103, Bonn. Prof. Winkel, Director.
Steinkohlenbergbauverein, Friedrichstr 2, Essen 1. Prof. Weissner.
Technischer Überwachungs-Verein Essen e.V. Steubenstr. 53, Essen 1.
Verein Deutscher Eisenhüttenleute, Breite Strasse 27, Düsseldorf.
Verein Deutscher Ingenieure (Kommission Reinhaltung der Luft), Prinz Georg Strasse 77/79, Düsseldorf. Secretary: M. Krämer.
Vereinigung der Grosskesselbesitzer e.V. Kurfürstenstr. 27, Essen 1.

India

All Indian Institute of Hygiene and Public Health. Industrial Health Research Unit, Section of Physiological and Industrial Hygiene, Calcutta.
Central Public Health Engineering Research Institute, 70-71 Civil Lines, Nagpur.

Israel

Central Laboratory of Air Pollution and Radiation Hazards, 27 Prof. Shor St. Tel-Aviv.
Public Council for the Prevention of Noise and Air Pollution, Tel-Aviv, P.O. Box 20127.

Italy

Consiglio Nazionale delle Ricerche Pizzale delle Scienza 7, Rome.
ILVA Society, Via Corsica 4, Genoa.
Institute of Hygiene, University of Ferrara, Corso Giovecca 173A, Ferrara.
Institute of Hygiene, University of Genoa, Via A. Pastore 1, Genoa.
Instituto di Ingegneria Sanitaria del Politecnico di Milano, Piazza Leonardo da Vinci 32, Milan.
Instituto Superiore di Santia, Viale Regina Elena 299, Rome.
Stazione Sperimentale per i Combustibili, Via De Gasperi 3, Milan.
NANS (Union of Nations for Fight against Noise and Smog) via Garibaldi, 25, Turin.

Japan

The Institute of Public Health, 1-39, Shiba Shirogane Daimachi, Minato-ku, Tokyo.
Kanto-Shin-Etsu Heat Control Society, 54 Takata-Oimatsu-cho, Bunkyo-ku, Tokyo.
Osaka Institute of Hygiene, 38 Kitaogimachi, Kita-Ku, Osaka.

Malta

National Society for Clean Air of Malta, 8-10 Civic Centre, Senglea.

Mexico

Instituto de Geofisica, Torre de Ciencias, Ciudad Universitaria, Mexico 20.

Netherlands

Atmospheric Pollution Division; 14 Duinweg, The Hague.
Central Organization/Applied Scientific Research T.N.O., Committee for Industrial Air Pollution, 12, Koningskade, The Hague.
Commission for Soil, Water, and Air, Baan 170, Rotterdam.
Council for Air Pollution, Zeestraat 73, The Hague.
Netherlands Association for Water, Soil and Air Pollution. Nienwe Achtergracht 100, Amsterdam.
Research Institute for Public Health Engineering T.N.O., (Organization for Health Research T.N.O.) Industrial Air Pollution Division, 97, Schoemakerstraat Delft.
Stichting Concawe (For conservation of clean air and water from oil refinery activities in Western Europe). 700 van Alkemaadelaan, The Hague. Secretary: Mr. G. P. Liedmeier.

Norway

Institute of Hygiene, University of Oslo, Blindern, Oslo.
Røykskaderädet, Meltzersgt 4, Oslo Dep. Oslo 1.

Poland

Air Pollution Control, Central State Board for National Water Economy, ul. Swietokrzyska 12, Warsaw.
Polish Academy of Sciences, ul. Hagera 17, Zabrze.

Portugal

Instituto Superior Ciencias, Sociais Universidade Técnica, Lisbon.

South Africa

Air Pollution Research Group of the Council for Scientific and Industrial Research, P.O. Box 395, Pretoria, Transvaal.

Spain

Municipal Institute of Hygiene, Place de Lesseps 1. Barcelona.

Sweden

AB Svenska Fläktfabriken, Kungsgatan 18, Stockholm.
Institutet för Vatten-och Luftvårdsforskning, Drottning Kristines väg 47 D, Stockholm.
National Institute of Public Health, Stockholm 60.
Swedish National Committee for Air Purification, Sveavärgen 166 XI, Stockholm.

Switzerland

Eidgenössische Kommission für Luftthygiene, Kreuzstrasse 26, 8008 Zürich.

U.S.A.

Air Pollution Control Association, 4400 Fifth Avenue, Pittsburgh, 1? Pa.
Air Pollution Foundation, 2556 Mission Street, San Marino, California.
Bay Area Air Pollution Control District, 1480 Mission Street, San Francisco 3, California.
Bituminous Coal Research Inc., 35 Hochberg Road, Monroe, Pittsburgh 13, PA.

California State Motor Vehicle Pollution Control Board, 217 W. First Street, Los Angeles 12, California.

Los Angeles County Air Pollution Control District, 434 S. San Pedro Street, Los Angeles 13, California.

New York Dept. of Air Pollution Control, 15 Park Row, New York 38 N.Y.

Robert A. Taft Sanitary Engineering Centre, 4676 Columbia Pky., Cincinatti 26, Ohio.

U.S. Dept. of Health, Education and Welfare, Public Health Service, Division of Air Pollution, DHEW Building South, Washington 25, D.C.

U.S.S.R.

Institute of Communal Hygiene, Pogodinskaja 10, Moscow.

Medical Control Committee on Air Pollution, State Medical Commission, Moscow.

State Committee on Chemistry, Moscow.

World Health Organization

Division of Environmental Sanitation, Palais des Nations, Geneva, Switzerland.

Regional Health Officer, Office for Europe, Scherfigsvej, Copenhagen, Denmark.

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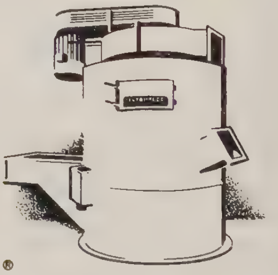

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Executive Council

Elected Divisional Representatives

Scotland: J. Foreman M. M. Beaton, I. W. Wintour.

Northern Ireland: W. E. C. O'Brien (co-opted).

North West: H. Clusky, W. E. Pollitt, A. W. Ward, F. Winder.

North East: Professor P. C. G. Isaac, L. Mair, Alderman B. N. Young.

Yorkshire: E. M. Birtwistle, J. Goodfellow, A. C. Saword, A. W. Perry.

West Midlands: S. Cayton, W. L. Kay, H. E. T. Lowbridge.

East Midlands: G. A. Hiller, R. Pane, T. Henry Turner.

South West: G. W. Dhenin.

South East: A. W. Brown, Miss P. M. Bryant, J. Clancey, W. Combey, G. B. Courtier, J. S. Hodgins, G. C. Stubbs, Dr. W. C. Turner, Mrs. M. E. Willison.

South Wales and Monmouthshire: W. Bate, Councillor D. F. Bevan.

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Divisional Councils

Scotland: M. M. Beaton, *President;* John W. Traill, *Hon. Secretary*, 73 John Street, Glasgow. Glasgow Central 9600, Ext. 2425.

Northern Ireland: R. Campbell Brown, *Chairman:* W. E. C. O'Brien. *Hon. Secretary:* Down County Health Dept., 414 Ormeau Road, Belfast, 7. Belfast 642905.

North West: Miss N. Kenyon, *Chairman;* W. E. Pollitt, *Hon. Secretary*, Health Centre, Salford, Lancs. PEN 5891 Ext. 263.

North East: Alderman B. N. Young, *Chairman:* L. Mair, *Hon. Secretary:* Health and Social Services Department, Civic Centre, Barras Bridge, Newcastle-upon-Tyne, 1. Newcastle 28520.

Yorkshire: A. C. Saword, *Chairman;* James Goodfellow, *Hon. Secretary*, Public Health Dept., 12 Market Buildings, Vicar Lane, Leeds, 1. Leeds 30211, Ext. 29.

West Midlands: Councillor F. V. Magness, *Chairman:* W. L. Kay, *Hon. Secretary*, Public Health Inspector's Office, Municipal Buildings, Old Hill, Staffs. Cradley Heath 66891.

East Midlands: J. F. Edwards, *Chairman;* G. Drabble, *Hon. Secretary*, Health Department, Town Hall, Chesterfield. Chesterfield 77232 Ext. 260.

South East: W. Combey, *Chairman:* J. S. Hodgins, *Hon. Secretary*, Public Health Department, Drayton Hall, West Drayton, Middlesex. West Drayton 2275.

South West: G. J. Creech, M.B.E., *Hon. Secretary*, St. Clement's House, Marsh Street, Bristol, 1. Bristol 26241.

South Wales and Monmouthshire: Alderman Dr. C. A. Bence, *Chairman:* L. Morgan, *Hon. Secretary*, 9 Lodge Drive, Port Talbot, Glamorgan. Port Talbot 2244 Ext. 45.

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Sustaining Members are defined in the Society's Articles of Association as members of any class—Individual, Local Authority or Corporate—who make an annual contribution of £100 or more. The following were the Sustaining Members at May 31, 1968.

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Coalite & Chemical Products Ltd.
Electricity Council
Esso Petroleum Co. Ltd.
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Imperial Chemical Industries Ltd.
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Northern Gas Board
North Thames Gas Board.
North Western Gas Board.
Scottish Gas Board
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South Eastern Gas Board.
West Midlands Gas Board.

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(*as at 1st January 1968*) (Associate Members in *Italics*)

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Northern Ireland Division

Antim C.C., Antrim R.D.C., Ballymena, Belfast, Carrickfergus, Castlereagh R.D.C., Londonderry, Portadown.

North West Division

Abram, Accrington, Altringham, Ashton in Makerfield, Ashton under Lyne, Atherton, Audenshaw, Bacup, Barrow in Furness, Bebington, *Birkenhead*, Blackburn, Blackpool, Bolton, *Bootle*, Bredbury & Romiley, Brierfield, Bucklow, Burnley, Bury, Buxton, Chadderton, Cheadle & Gatley, Cheshire C.C., Chester, Chorley, Church, *Clitheroe*, Colne, Connah's Quay, Crewe, Crompton, *Crosby*, *Cumberland C.C.*, Darwen, Denton, Droylsden, Dukinfield, Eccles, Ellesmere Port, Failsworth, Farnworth, Fleetwood, Flint, Fulwood, Glossop, Golborne, Great Harwood, Hale, Haslingden, Haydock, Hazel Grove & Bramhill, Heywood, Hindley, Horwich, *Hoylake*, Huyton with Roby, Hyde, Ince in Makerfield, Irlam, Kearsley, Kirkby, Lancashire C.C., Lancaster, Lees, Leigh, Leyland, Littleborough, Liverpool, Longdendale, Macclesfield, Manchester, Marple, Matlock, Middleton, Middlewich, Mold, Morecambe & Heysham, Nantwich, Nelson, Newton le Willows, Northwich R.D.C., Northwich U.D.C., Oldham, Ormskirk, Padiham, Preston, Preston R.D.C., Prestwich, Radcliffe, Ramsbottom, Rawtenstall, Rhyl, *Riston*, Rochdale, Royton, Runcorn R.D.C., Runcorn U.D.C., St. Helens, Sale, Salford, Skelmersdale, *Southport*, Stalybridge, Standish with Langtree, Stockport, Stretford, Swinton & Pendlebury, *Thornton Cleveleys*, *Tintwistle*, Tyldesley, Up Holland, Urmston, Wallasey, Warrington, *Warrington R.D.C.*, *West Lancashire R.D.C.*, Whiston R.D.C., Whitefield, Whitworth, Widnes, Wigan, Wilmslow, Winsford, Workington, Worsley, Wrexham, Wrexham R.D.C.

North East Division

Ashington, Barnard Castle, Bedlingtonshire, Billingham, Bishop Auckland, Blaydon, Brandon & Byshottles, Castle Ward, Chester le Street R.D.C., Chester le Street U.D.C., Consett, Crook & Willington, *Darlington*, Durham R.D.C., Eston, Felling, Gateshead, Gosforth, Hartlepool, Hebburn, Hetton, Houghton le Spring, Jarrow, Lanchester, Longbenton, Middlesbrough, Newburn, Newcastle upon Tyne, Northumberland C.C., Prudhoe, Redcar, Ryton, Saltburn & Marske by the Sea, Seaham, Sedgefield, Shildon, Skelton & Brotton, South Shields, Spennymoor, Stanley, *Stockton on Tees*, Sunderland, Thornaby on Tees, Tynemouth, Wallsend, Washington, Whitley Bay.

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West Midlands Division

Aldridge, Brownhills, Atherstone, Bedworth, Birmingham, Burton upon Trent, Cannock R.D.C., Cannock U.D.C., Coventry, Dudley, Halesowen, Hereford, Kidderminster, Leamington Spa, Lichfield, Meriden, Newcastle under Lyme, Nuneaton, Redditch, Rugby, Rugeley, Seisdon, Solihull, Stafford, Staffordshire, Stoke on Trent, Stone, Sutton Coldfield, Walsall, Warley, Warwick, Warwick R.D.C., *Warwickshire C.C.*, *Wellington*, West Bromwich, Wolverhampton, Worcester.

East Midlands Division

Alfreton, Basford, Beeston & Stapleford, Belper R.D.C., Belper U.D.C., Bingham, Blaby, Blackwell, Bolsover, Boston, *Cambridge*, Carlton, Chesterfield, Clay Cross, Clowne, Coalville, Corby, Derby, Dronfield, Eastwood, Gainsborough, Glanford Brigg, Grantham, Great Yarmouth, Grimsby, Heanor, Hinckley, Ilkeston, Ipswich, Irthlingborough, Kettering, Kings Lynn, Kirkby in Ashfield, Leicester, Lincoln, *Lincoln C.C.* (Parts of Kesteven), *Lincoln C.C.* (Parts of Lindsey), Long Eaton, Loughborough, Lowestoft, Mansfield, Mansfield Woodhouse, Newark, Norwich, Nottingham, *Nottinghamshire C.C.*, Old Fletton, Peterborough, *Repton*, Rushden, Scunthorpe, Southwell, Stavely, Sutton in Ashfield, Swadlingcote, Wellingborough, Welton, Wisbech, Worksop, Worksop R.D.C.,

South West Division

Bath, *Bathavon*, *Bridgewater*, Bristol, Cheltenham, Dursley, Gloucester, *Keynsham*, Kingwood, Lydney, *Mangotsfield*, *Norton Radstock*, Poole, *Shepton Mallet*, *Sherborne*, *Sodbury*, Stroud, Swindon, *Tetbury*, *Tewkesbury*, Thornbury, *Weston super Mare*, West Penwith, Weymouth & Melcombe Regis.

South East Division

Amersham R.D.C., Aylesbury, Barking, Barnet, Basildon, Bedford, Bedfordshire C.C., Bexley, Bishop's Stortford, Bletchley, *Bognor Regis*, *Bournemouth*, Braintree R.D.C., Brent, Brentwood, Brighton, Bromley, Bullingham R.D.C., Bushey, Camden, Chatham, Chesham, Cheshunt, Chigwell, *Clacton*, Crawley, *Croydon*, *Cuckfield*, Dartford, Dartford R.D.C., Dover, Ealing, Eastbourne, Easthampstead, Eastleigh, Egham, Elstree, Enfield, Epping & Ongar, Epsom & Ewell, Esher, *Essex C.C.*, Eton, *Farnborough*, Folkstone, Gillingham, *Gosport*, Gravesend, Greater London Council, Greenwich, Guildford, Guildford R.D.C., Hackney, Hammersmith, Harlow, Harrow, Hastings, Havant & Waterloo, Havering, Hemel Hempstead, High Wycombe, Hillingdon, Hitchin, Hoddesdon, Horsham, Hounslow, Hove, *Kensington & Chelsea*, *Kent C.C.*, Kingston upon Thames, Lambeth, *Leatherhead*, Lewisham, *Littlehampton*, London, Luton, Maidenhead, Merton, New Forest, *Newham*, Northfleet, Oxford, *Portsmouth*, *Reading*, Redbridge, *Reigate*, Richmond-upon-Thames, Rickmansworth, Rochester, St. Albans, Slough, *Southampton*, *Southend on Sea*, Southwark, Southwick, Staines, Strood, Sutton, Thurrock, Tower Hamlets, *Tunbridge Wells*, Watford, Watford R.D.C., Westminster, New Windsor, Windsor R.D.C., *Worthing*, Wycombe R.D.C.

South Wales & Monmouthshire Division

Abercarn, Aberdare, Abertillery, Barry, Bedwas & Machen, Bedwellty, Bridgend, Caerleon, Caerphilly, Cardiff, Cardiff R.D.C., Cwmbran, Ebbw Vale, Gellygaer, Glamorgan C.C., Llanelly, Llanelly R.D.C., Llantrisant & Llantwit Fadre, Magor & St. Mellons, Merthyr Tydfil, Monmouthshire C.C., Mountain Ash, Mynyddislwyn, Neath, Newport, Penarth, Pontypool, Pontypridd, Port Talbot, Rhondda, Swansea, Tredegar, Ystradgynlais.

Overseas

Durban (South Africa), Geleen (Netherlands), Johannesburg (SouthAfrica), Leichhardt (Australia), *Newcastle* (Australia), *Vereeniging* (South Africa).

38th ANNUAL REPORT
for 1967

FOR an association dependent for its existence on the goodwill of its members and friends, the prevailing national climate of economic stresses and uncertainties, together with continually rising costs, cannot but create some sense of insecurity and makes difficult not only growth, but the prevention of some contraction. A voluntary society such as ours cannot for long stand still, it must either continue to develop or begin to decline.

Fortunately for clean air the Society is still moving forward, although more slowly than we would wish. Membership has been well maintained, and what small losses there have been have been found in nearly every case to be due to economic factors, and have been balanced by new membership. Nevertheless, the increased costs of running an organization, with reduced surpluses from the conference and exhibition accounts, have made necessary a small drawing upon reserves.

That is what reserves are for, but the process cannot often be repeated, and therefore one of the pressing needs is to seek to increase subscriptions and other sources of revenue. An increase in subscription rates has been considered, but although this may have to come, the present time is not felt to be opportune. The alternative, to increase membership and special (perhaps short-term) annual donations, is therefore being planned, even though such a drive may well mean some temporary diversion of effort from the pursuit of the objectives for which the Society exists. The way in which members have maintained their support of the Society during the present and earlier periods of difficulty creates confidence in the expectation that they will also support our efforts and that many will themselves seek to secure new members.

The Annual General Meeting

The annual business meeting of the Society was held in London on 2 May, and was followed by the customary luncheon. The speaker at a meeting following the annual meeting, and principal guest at the luncheon, was Mr. Reginald Freeson, M.P., Parliamentary Secretary, Ministry of Power. His address, reported in full in the Summer, 1967, issue of *Smokeless Air*, was greatly appreciated, especially as he was able to speak as one who, in local government, had been directly concerned with the inauguration of smoke control areas.

At the annual meeting the election was announced of Sir John Charrington as the new President to succeed Sir Alan Wilson, F.R.S. Sir John, whose election was warmly applauded, has been a close friend of the Society for many years, is a member of the Clean Air Council, and has done much to encourage the solid fuel interests to accept clean air policy.

The Annual Conference and Exhibition

After the International Congress in London in 1966, the annual conference at Blackpool in October was very much a home occasion. The conference had an important programme of papers, covering a wide field of interest, and the *Proceedings* constitute a further valuable addition to the literature on air pollution. The welcome and hospitality given by the Mayor of Blackpool, Alderman Leslie Pilkington, J.P., and the Corporation, was exceptionally friendly and greatly helped towards the success of the occasion.

The conference was opened by the Minister of State, Ministry of Transport, Mr. Stephen Swingler, M.P., whose address is recorded in *Smokeless Air*, Winter, 1967.

A Des Vœux Memorial Lecture, on "Clean Air and Future Energy" was given by Dr. F. E. Schumacher, and created unusual publicity and controversy because of its outspoken criticisms of atomic energy policy. It was felt that it made necessary some right of reply or defence. The replies are included, with the lecture, in the Conference *Proceedings*.

The conference papers were *Some Specific Air Pollution Problems*, by J. A. Bonnell and P. J. Lawther; *Clean Air and the North West Environment*, by U. Aylmer Coates; *Some Mineralogical Aspects of Air Pollution Damage to Limestone*, by K. J. Henley; *Corrosion by Air Pollution: A Review*, by J. R. Goss; *The Emission of Grit and Dust from Furnaces*, by D. Hicks; *The Cost of Domestic Smoke Control*, by A. R. Smith; *Industrial and Municipal Incineration of Refuse*, by E. J. Ostle and *The Role of Oxygen-Fuel Burners in Scrap Consuming Steelmaking Processes and their Effect on Fume Emission*, by G. D. Spenceley.

In addition, Dr. Albert Parker, as Chairman of the Technical Committee, presented for discussion the report on *Air Pollution from Road Vehicles*, and T. H. Iddison, for the Parliamentary and Local Government Committee, introduced their report on *Smokeless Heating in New Housing*.

One resolution only was adopted by the Conference, and arose from the discussion on the road vehicle report. It was duly submitted to the Minister of Transport, and read:

> That this Conference draws to the attention of the Minister of Transport the Society's *Report on Air Pollution from Road Vehicles*, which shows that it is now technically feasible to reduce the emissions of petrol engined vehicle carbon monoxide and diesel road vehicle smoke to acceptable levels, so that legislation can now be enacted to set suitable limits by a reasonable date.

Council and Committees

The Executive Council at its first meeting after the annual general meeting elected as its new chairman, Mr. A. C. Saword, who succeeded Mr. James Goodfellow after the usual two-year term of office. The thanks of the Council were expressed to Mr. Goodfellow for his successful tenure of the office, and it is a pleasure to record them here. The senior deputy chairman, Dr. W. C. Turner, was re-elected, and a new joint deputy elected was Mr. Stanley Cayton.

The Council met regularly during the year, as did its five committees. The Parliamentary and Local Government Committee was principally concerned with the report presented at the conference on *Smokeless Heating in New Housing*, and with consideration of possible provisions in the new clean air legislation that it was hoped would be introduced (as a Private Members Bill) in 1968. The Technical Committee was fully occupied by the completion of its report on air pollution from road vehicles.

Road Vehicle Pollution

The study of this increasingly important problem made by the Technical Committee, and published in booklet form with the title *Air Pollution from Road Vehicles*, was introduced at a special press conference that resulted in a gratifying amount of publicity. In addition to the discussion at the Blackpool conference the report has been widely distributed. It was described by the Minister of State as "a sane, balanced document", and the Society should be grateful to the committee and those who assisted it for a document that has proved to be of equal importance to the previous report of the Technical Committee on *Sulphur Dioxide as an Atmospheric Pollutant*. In particular thanks are due to Dr. J. S. G. Burnett, who as former chairman initiated the work, to the present chairman, Dr. Albert Parker, to Mr. A. R. Smith, who acted as secretary for the project, and to Mr. Philip Draper, who gave special technical assistance.

The Divisions

The Divisional Councils have continued to be active, as their separate reports (to be published later in the *Clean Air Year Book*) will show. The South

Wales and Monmouthshire Division has again become active after a period of some difficulty, with a new chairman and honorary secretary. During the year Mr. Alfred Wade, who had been honorary secretary of the East Midlands Division since its formation in 1951, retired from the post, and received a presentation from members at a meeting at which tributes were made to him for his valued services in creating and sustaining the Divisional Council and in promoting clean air in the region.

Public Relations

The information and library services of the Society have continued to provide evidence of the general interest in and concern about all aspects of air pollution. In addition to many calls from both members and non-members from this country there were visits from overseas delegations and individuals. Three groups came from Czechoslovakia, and individuals from Switzerland, Mexico, Japan, Germany, and South Africa.

Press releases on the Society's activities and publications gave much useful publicity, and approximately 800 cuttings referring to the Society were received during the year. At least 12 radio and television programmes dealt with aspects of air pollution, several of them referring to the Society.

As in previous years, the Society participated in the congress exhibition of the Royal Society of Health. The Society participated in a meeting with the British Institution of Plant Engineers and a study group of the American Institute of Plant Engineers, ending a European tour on air and water pollution in London. Dr. Parker and Mr. Marsh were among the speakers on clean air at this informal and friendly gathering.

Because of increasing demand for photographs a number of new subjects, in colour, have been made available, and these, together with black and white prints are being used extensively for exhibition and display purposes.

Staff

The end of the year marked the retirement of Mrs. D. M. Wolfe, who for twenty years had been responsible for the keeping of the Society's accounts and transactions, and the recording of membership information. Grateful thanks for her services and good wishes for her retirement are extended to her. Mr. Peter Mitchell has been appointed as her successor.

The Director of the Society is due to retire on 31 May, 1968, after forty years' service, which began in Manchester as secretary to the Smoke Abatement League of Great Britain, one of the two bodies that became the present Society. To allow for a necessary overlap, the appointment of a successor was advertised and from a number of applications the appointment was made of Rear Admiral P. G. Sharp, C.B., D.S.C., who had recently retired from the Royal Navy with considerable administrative experience. Rear Admiral Sharp was appointed to act as Director Designate from 1 January, 1968, until he takes over from Mr. Marsh on 1 June.

Field House,
Breams Buildings
London, E.C.4.
January, 1968

A. C. SAWORD, *Chairman*
STANLEY E. COHEN, *Hon. Treasurer*
ARNOLD MARSH, *Director.*

Scottish Division

The main event of the year was the Annual General Meeting and Conference held in Ayr from 17th to 19th May, 1967. At the Annual General Meeting it was reported that the course for firemen, boiler attendants, engineers, etc., run jointly by the Division and the Corporation of Glasgow, on boiler house practice, smoke abatement, fuel economy and plant efficiency, continued to be very well supported. The lecturer, Mr. John H. Christie, Senior Smoke Inspector of Glasgow, submitted a report on the 51st Winter Session, and details were given of the prizes and certificates awarded to the successful students.

The principal speaker at the Conference was Dr. W. A. Horne, who had recently retired as Medical Officer of Health for Glasgow. His address was entitled "Must we have unclean air". The Town Chamberlain of Dumbarton, Mr. John Nelson, gave a paper on "The Financial implications of the Clean Air Act, 1956". In the afternoon of the first day delegates visited Hunterston Nuclear Power Station and houses at Ardeer fitted with "Flexel" ceiling heating. The Division was grateful to the South of Scotland Electricity Board and I.C.I. for making arrangements for these visits.

On the second day of the conference papers were given by Dr. E. A. B. Birse, Chief Chemical Inspector, Scottish Development Department, on "Progress in Industrial Pollution Control", by Dr. L. E. Reed of Warren Spring Laboratory on "Pollution from motor vehicles", and by Mr. G. Knox, Senior Fuels Development Engineer, Shell and B.P. Scotland Ltd., on "Industrial chimneys for oil fired plant".

A civic luncheon was provided by Ayr Town Council to delegates and their friends and the Division expressed appreciation for the hospitality received. The proceedings concluded, as usual, with the Divisional luncheon, and the general opinion of the delegates seemed to be that the conference had been both interesting and stimulating. It certainly received quite wide publicity in the press and television.

The Division met on two occasions and the Executive Committee on four occasions during 1967. In order that greater publicity could be given to the activities of the Division, a Sub-committee on Publicity has been appointed, and it is hoped that this will result in wider coverage being given to the Division's work to promote Clean Air. Mr. George N. Stewart, an individual member who is an expert on Publicity and Public Relations, has been co-opted to this subcommittee.

J. W. TRAILL, *Hon. Secretary*

Northern Ireland Division

There was a slight increase in membership during the year and it is hoped this trend will be continued.

The main event of the year was the Autumn Meeting held in the Town Hall, Ballymena, on the 15th November. The meeting was very well attended by representatives from government department, local authorities, other public bodies and industrial and professional organizations.

The papers presented by Mr. W. L. Fleming, Public Health Inspector, Castlereagh Rural District Council, Mr. A. Archer, Chief Public Health Inspector, Halesowen, Mr. A. R. Smith, London, and Mr. H. H. McKinty, Chief Technical Officer, Coal Advisory Service, Belfast, were well received and the lively discussion which followed was an indication of the interest and appreciation of those present.

The Autumn Meeting was most successful and in its own way made a real contribution to the cause of clean air.

During the year Smoke Control Orders were made by a number of local authorities and confirmed by the Minister of Health and Social Services, and it is felt that this quickening of interest in smoke control will spread.

At the Annual General Meeting, Mr. R. Campbell Brown, B.Eng., C.Eng., A.M.I. Mech. E., M.I.Mar.E., Technical Director, Davison and Co. Ltd., was elected Chairman and Mr. William Jenkins, Chief Public Health Inspector, City of Belfast, Deputy Chairman.

W. E. C. O'BRIEN, *Hon. Secretary*

North-East Division

Two meetings of the Division were held during 1967, the annual meeting being held in April at Norgas House, the headquarters of the Northern Gas Board at Killingworth, Northumberland. In his annual address the Chairman, Alderman B. N. Young, O.B.E., once more referred to the lack of progress being made in smoke control in the North East region as compared with other parts of the country and he reiterated his belief that the continuing financial burden placed upon local authorities by the increase in costs of conversion was one of the greatest obstacles in the North. He expressed the view that the only satisfactory solution to this problem of finance would be for the total cost to be borne by the Central

Government. At the conclusion of the Chairman's address it was moved, seconded and unanimously carried that the existing officers be re-elected as follows:—

Chairman:
Alderman B. N. Young, O.B.E., of Gateshead C.B.

Vice Chairmen:
Councillor T. Prudham of Felling U.D. and Professor P. C. G. Isaac of the University of Newcastle upon Tyne.

Hon. Secretary and Treasurer:
L. Mair, F.R.S.H., F.A.P.H.I., of Newcastle upon Tyne C.B.

Hon. Auditor:
F. Ireland, B.A.(Com), F.C.A., F.I.M.T.A., City Treasurer, Newcastle upon Tyne C.B.

The formal business of the annual meeting was followed by a symposium on "Gas and Clean Air", the first speaker being Mr. W. E. Bouch, B.SC., Development Engineer of the Northern Gas Board, whose theme was "From Coal Gas to Natural Gas". This address included references to the difficulties of the gas industry in the early 1950's and the solution to the problem then existing resulting from the discovery of new sources of gas and the production of gas from light oil. Mr. Bouch's address was accompanied by coloured slides and diagrams which explained in a most interesting fashion the methods of importing liquid natural gas.

The second part of the symposium was given by Mr. Alan S. Middleton, B.COM., Commercial Manager of the Northern Gas Board who dealt with "Gas Today and Tomorrow and its Effect on Clean Air". Mr. Middleton drew a picture of the immediate future in the region when North Sea gas would be plentifully available. Because of the virtually unlimited supplies of this gas from the North Sea he suggested that the gas industry could provide a complete solution to the clean air problem.

A lively and informative discussion ensued followed by a vote of thanks proposed by Alderman Mrs. V. Hope of Jarrow M.B. who thanked not only the speakers for giving the papers, but also the Northern Gas Board for the very excellent facilities which they had provided for the meeting to be held and for the lavish hospitality which had been bestowed upon members by the Board when being entertained to lunch at the Banqueting Rooms, Gosforth Park, after they had enjoyed a conducted tour of Norgas House.

The second meeting of the Division was held at the Five Bridges Hotel in Gateshead in early October when 75 members were present. The main business of the meeting was the presentation of an address, dealing with the detection and measurement of stack solids and emission problems associated therewith, by Technical Officers of the Shell Mex and B.P. Ltd. Mr. D. Barber, A.M.I., Mech.E., Senior Fuels Development Engineer of Shell Mex and B.P. Ltd., described the part played by his Company in pioneering the use of oil as a fuel during the past sixty years or so and outlined the functions of the Technical Advisory Services made available by his organization. His address was followed by a coloured film "The Underwater Search" dealing with the problems and techniques of offshore drilling. The Chairman thanked the Company for providing such an excellent speaker and for the generous hospitality afforded to members.

Throughout the year the Chairman and Secretary noted with concern the continued lack of active interest of many local authorities in the progress of smoke control and it was felt with some regret that when economic cuts were imposed in the public sector of expenditure, smoke control was one of the first victims. Although at the close of the year such belief was without foundation, it was hoped that there will be some small sign of improvement in the economic picture before the end of 1968 which might lead to a more realistic approach to pollution abatement problems in the north east.

L. MAIR, *Hon. Secretary*

North-West Division

Progress towards clean air in the North West went ahead steadily throughout the year, and a number of authorities should complete the Smoke Control programme for the whole of their areas during 1968. It is hoped that next year will see the beginning of the end as far as coal smoke in the North West is concerned. Meanwhile, as the battle against smoke is being steadily won, the interest of the Society is turning to the problems of vehicle exhausts and odours from industrial plants.

The Division held its Annual General Meeting on 12 April, 1967, at the Electricity Board's Research Laboratories of

Capenhurst, where members were entertained to lunch by the Board. The Divisional Council met on four occasions. Miss Kenyon of the Women's Electrical Association was elected Chairman in succession to Mr. Alan Taylor, Mr. F. Winder was elected Vice Chairman, Mr. W. E. Pollitt was elected Hon. Secretary, and Mr. H. Clusky was elected Hon. Treasurer.

The members of the Division visited Stoves Ltd. where Dr. Culshaw spoke to them on the future of the gas industry, and where the Managing Director and staff entertained them to lunch.

The Division provided speakers at clubs and schools on a number of occasions and provided information about the Society to many interested people.

W. E. POLLIT, *Hon. Secretary*

Yorkshire Division

The Divisional Council met on four occasions during the year. In March, there was a formal business meeting held in Leeds. In April, the Council visited Universal Machinery and Services Ltd. at Millshaw, Leeds, where Mr. L. Barnett the Managing Director gave a talk on "Smokeless Incineration" and the members of the Council witnessed the smokeless disposal of many types of refuse in two large incinerators. In June, the Council were the guests of the East Midlands Gas Board at Sheffield where they received an address on "Natural Gas and its Utilisation in Smoke Control Areas" from E. K. Eastabrook of the East Midlands Gas Board. Sunderland was the venue in July, and the members of the Council, at the invitation of the National Coal Board, inspected the Solid Fuel Domestic District Heating Scheme at Gilley Law.

Two successful open meetings were held during the year, the first in Bradford at the invitation of the North Eastern Gas Board in May, when Mr. B. H. Croft addressed members on the "A. E. Petrol Injection System and its Control of Automative Exhaust Emissions". After the talk, members were able to inspect a vehicle to which an electronically controlled petrol injection system had been fitted. Over 100 people attended the second open meeting held at the Parkway Hotel, Leeds, at the invitation of Shell-Mex and B.P. Ltd. in October. Mr. D. Barber spoke on the "Detection and Assessment of Stack Solids and Chimney Emissions"; there was an exhibition of instruments and apparatus used in connection with this assessment, and members saw the film "The Underwater Search".

JAMES GOODFELLOW, *Hon. Secretary*

West Midlands Division

The Annual General Meeting of the Division was held at the West Midlands Gas Board Headquarters, Solihull, on the 19th April, 1967, members of the Division being entertained to lunch by the Board. A series of excellent papers, accompanied by practical demonstrations and colour films ably dealt with the various aspects of natural gas. Speakers included the Chairman, and Deputy Chairman of the Board, the Directors of Marketing and Finance, the Conversions Manager and the Assistant Distribution Engineer. The Gas Board had gone to considerable trouble to ensure that all present were fully aware of the tremendous potential of this new source of fuel. An excellent exhibition admirably illustrated the tremendous support which the modern gas industry gives to the cause of clean air. There was a record attendance and all present voted the meeting an outstanding success.

During the year the Divisional Council dealt with several matters, the most important being "Clean Air Action Weeks" "Stubble Burning" and "Publicity". In this latter connection a questionnaire addressed to all local authorities on progress in the formation of Smoke Control Areas yielded valuable information. The Divisional Council greatly appreciated the help given by all those who completed the questionnaire.

This report ends on a rather sad note in that we have to record the retirement on grounds of ill-health of our chairman, Mr. Councillor F. V. Magness, C.B.E. He has guided our affairs for the past 8 years and we and the Society as a whole owe him a tremendous debt of gratitude. Possessed of an enquiring mind, breadth of vision and a forthright manner, he has ensured that our deliberations have always been of a positive nature. It is our earnest hope that he will speedily regain complete health. One thing we can be sure of is that his interest in the cause of clean air will remain undiminished.

W. L. KAY, *Hon. Secretary*

East Midlands Division

Whilst there has been no lack of enthusiasm on the part of the constituent Authorities in the East Midlands Division during the year as evidenced by the support given to the meetings arranged, disappointment must again be expressed at the continued slow progress being made in the establishment of smoke control areas. The Ministry of Housing and Local Government has expressed concern at this slow progress and those Local Authorities who have not yet submitted proposals have been requested to do so and others have been asked to accelerate their programmes. It is hoped that this directive will be heeded and that a rapid extension of smoke control will follow.

At the Annual General Meeting of the Division, Mr. Alfred Wade, M.B.E., who held the position as Honorary Secretary from the formation of the Divisional Council over 18 years ago, retired from this post, to the regret of all the members of the Division. The contribution made by Mr. Wade in furthering the aims and objects of the Society when the Chief Public Health Inspector for the City of Nottingham, and throughout the period he has been Secretary of the Division and a member of the National Executive Council, cannot be overstated. The presentation of a cine camera was made to Mr. Wade by the Director of the Society on behalf of the members of the Division, as a token of their regard for his services. (An appreciation of Mr. Wade was published in the Autumn 1967 edition of "Smokeless Air".)

Three meetings were held in the Division during the year.

On 16 March, by invitation of the East Midlands Gas Board, members of the Division met at the Victoria Hotel, Nottingham, for a working lunch at which Dr. J. F. Eaton, Adviser on Clean Air to the Gas Council, presented a very interesting and topical paper entitled "Natural Gas and Clean Air". Mr. Arnold Marsh, Director N.S.C.A., opened the discussion on the paper.

The Annual General Meeting was held in the offices of the National Union of Mineworkers (Derbyshire Area), Saltergate, Chesterfield, at the invitation of the Chesterfield Rural District Council on 12 July. Members were welcomed by Councillor Everett on behalf of the Chesterfield R.D.C. in the unavoidable absence of Councillor B. Smith, Chairman of the Council.

The Chairman extended a special welcome to Mr. Arnold Marsh who had been invited to address the meeting and also to make a presentation to the retiring Secretary, Mr. Alfred Wade.

The officers elected for the ensuing year were as follows:

Chairman:
Mr. J. F. Edwards, Chief Public Health Inspector for Cambridge.
Deputy Chairman:
Councillor F. Brothwell, Bolsover U.D.C.
Honorary Secretary:
Mr. G. Drabble, Chief Public Health Inspector, Borough of Chesterfield.

Mr. John Wilson, Chief Public Health Inspector of Chesterfield R.D.C. presented a paper entitled "Smoke Control—Progress and Problems", which opened with a critical review of the progress or lack of progress which had been made with smoke control in the "Black Areas" up to June 1966, when only 32·8 per cent of premises in these areas were either under control or awaiting confirmation of Orders submitted. This interesting and informative paper, dealing with procedure and finance in the preparation of Smoke Control Areas also, is included in the Autumn 1967 edition of "Smokeless Air".

On 7 September, a very successful and interesting meeting was held at the Coalite Works of the Coalite and Chemical Products Ltd., Bolsover, at the invitation of the Company, 78 members of the Division being present.

In order that all members should have an opportunity of seeing all the processes carried out in these very extensive works, the party was divided, one party visiting the Coalite production section and the other the Refinery during the morning session, the parties being changed in the afternoon.

A total of 1,700 tons of coal are carbonized daily at this plant in the production of 1,200 tons of Coalite and many other chemical products. The improvements effected at these works in recent years in preventing the escape of pollutants during the charging and discharging of the retorts and during the quenching and conveyance of the finished Coalite, deserves special mention, and reflects considerable credit on the Company.

At the close of the morning session, members were entertained to lunch at the Station Hotel, Chesterfield, at the kind invitation of the Directors of the Company, the guests being welcomed by A. Goodsall Esq., and N. Flach Esq., Joint Managing Directors and R. Pane Esq., Sales Manager of the Coalite Division.

In his address of welcome Mr. Goodsall, speaking of his Company's contribution towards clean air, stated with justifiable pride that since 1963 the production of Coalite at the Bolsover, Askern and Grimesthorpe plants had increased by 110 per cent and this was achieved well in advance of the target date. The Company are now the Country's largest producer of re-active solid smokeless fuel.

G. DRABBLE, *Hon. Secretary*

South East Division

The activities of the Division have followed what has become a well-established pattern—a series of visits during the summer, the A.G.M. with a guest speaker and one other General Meeting. It is possible that this pattern has become too well established and that new ideas are required which will stimulate members to take a greater interest in the work and affairs of the Society. Evidence that the good progress made in Smoke Control in the Greater London Area (far greater than in any other region in the country) is leading to a dangerous complacency is growing. It cannot be emphasised too strongly that the *smoke control* which has so far been achieved is only a first step towards the ultimate objective—*clean air.*

The problem of sulphur pollution is still to be tackled and pollution from road vehicles will, it appears certain, continue to grow unless strong and persistent pressures from influential bodies, among which this Society is foremost, is exerted. Even in smoke control, limited as it very largely is to the Black Areas, there is room for progress on a far wider front. Many country towns and coastal towns not officially classified as Black Areas, have, according to the monthly figures published by Warren Springs Laboratory, levels of pollution which belie their self-imposed designation as White Areas. The field of activity is therefore still wide open but the big question is whether this Society still has enough energy and crusading spirit left to see the job through.

The following visits were much enjoyed by the members who took part and we are greatly indebted to our various hosts for the splendid arrangements made for our instruction and enjoyment:

25 May, Watson House, Fulham—the Research Establishment of the North Thames Gas Board.

28 June, Gas fired on-site refuse destruction at Westminster and Wolverton—arranged by the Gas Council.

19 July, Mogden Sewage Works, Isleworth.

6 September, Warren Spring Laboratory, Stevenage.

A well-attended meeting was held on the 1 March, at which Mr. T. Steel, C.P.H.I., Crawley New Town, gave a controversial paper entitled "New Thoughts on Smoke Control". A spirited discussion followed.

The Annual General Meeting was held on the 20 November. Because there were no other nominations, all the retiring officers and members of the Council were automatically re-elected. This was the second time in three years that this has happened and could be a further indication of diminishing interest. Following the business meeting Dr. P. J. Lawther, Director, Air Pollution Research Unit, Medical Research Council, gave a talk on Research into Medical Aspects of Air Pollution. As Dr. Lawther was in his usual inimitable form, it goes without saying that he kept the interest and attention of members throughout his talk.

J. S. HODGINS, *Hon. Secretary*

South West Division

The events of the Division from 1967-68 can probably best be summarized in the excellent Clean Air Exhibition organized by the Bristol Department of Health in September, 1967. This was opened by the Lord Mayor of Bristol and Dr. A. Parker, C.B.E., and was very well attended. The Annual Meeting of the Division, which was also well attended, was held in Bristol during the course of the Exhibition.

One of the highlights of the meeting was a talk together with a film show and display of apparatus on the "Measurement of Stack Solids from Oil Boilers", given by Mr. de Keyser, Fuel Development Engineer, Shell Mex and B.P. Ltd.

G. J. CREECH, *Hon. Secretary*

South Wales and Monmouthshire Division

The Division held two meetings during the year. The first, which was well attended, took the form of a talk followed by a visit to the Electrical Engineering Works of the Aberdare Holdings. Lunch was provided by the kind courtesy of Sir Alfred Nicholas, the Chairman.

The second meeting, which was the Annual General Meeting of the Division, when Mrs. P. M. Mainwaring was elected Chairman and Councillor Frank Bevan, Vice Chairman, was held at the Afan Lido, Port Talbot. The A.G.M. proper was followed by a talk and discussion on the use of oil as a fuel under the Clean Air Act.

L. MORGAN, *Hon Secretary*

Information About the Society

The forerunners of the Society were the Coal Smoke Abatement Society, established in London in 1899, the Smoke Abatement League of Great Britain (1909) concerned mainly with the Provinces, and the National Smoke Abatement Society, formed in 1929 by the amalgamation of the two parent organizations. At a Special General Meeting held in April 1957, it was agreed unanimously to change the name of the Society to "National Society for Clean Air", and to seek incorporation as a company limited by guarantee, a licence being sought from the Board of Trade to omit the word limited. The Society assumed its new name and status as from 1st January, 1958. For further information about membership, Executive Council and Committees, etc., reference should be made to the Society's Memorandum and Articles of Association and Byelaws.

Divisions

For electoral purposes and where it is desired, area organization, the Society is now composed of the following geographical Divisions: (1) Scotland, (2) Northern Ireland, (3) North West, (4) North East, (5) Yorkshire, (6) West Midlands, (7) East Midlands, (8) South West, (9) South East, (10) South Wales and Monmouthshire. (See Byelaws for the Counties in each Division).

Membership

The Society is wholly dependent on the contributions of its members for the growth and the maintenance of its work, and invites the support of all who sympathize with and wish to promote its objects. These are stated in full in the Memorandum of Association, but they may be briefly summarized as the securing throughout the United Kingdom of the maximum of natural light and air free from every form of pollution, particularly that arising from the combustion of fuel. There are three main classes of membership—for individuals, local authorities, and corporate bodies such as firms, public undertakings and institutions. Individual members and the representatives of other members have rights of nomination and voting in elections for Officers and Council. They receive, free of charge, the Society's quarterly journal *Smokeless Air* and other publications. Local authority and corporate full members are also entitled to receive one *extra* copy of *Smokeless Air* and the Society's Year Book for each guinea by which their subscription exceeds three guineas. Corporate members who have branches or offices in Divisions of the Society other than that in which their Registered Office is situated may appoint Delegates to participate in the activities of those Divisions. Members are entitled to receive assistance and information on problems relating to air pollution.

In addition to receiving notices of meetings and conferences organized nationally, they are entitled to participate in any activities organized by or within their Division.

Associates

Any individual, local authority, institution or corporate body contributing less than the appropriate membership subscription may become an *Associate*, entitled to some of the privileges of membership, but not to those relating to nomination, voting and election to office.

Subscriptions

Individual Members—Not less than £1 1s. 0d. a year.

Local Authority Members—Not less than the following amounts, according to populations:

Less than 25,000	..	6 guineas
25,000 to 50,000	..	8 ,,
50,001 to 75,000	..	10 ,,
75,001 to 100,000	..	15 ,,
100,001 to 250,000	..	25 ,,
250,001 to 500,000	..	36 ,,
Over 500,000	..	48 ,,

Corporate Members (which includes Companies, Firms, and Departments of Local Authorities)—Not less than 25 guineas for members appointing two Representatives; not less than 15 guineas for members appointing one Representative.

(Under Article 5 (e) (ii) of the Society's Articles of Association, an Association or firm which is not incorporated can appoint representatives to act on its behalf, and obtain all the benefits of Corporate Membership.)

Sustaining Members—A Member in any class subscribing not less than £100 a year. (See list page 66.)

Special Cases—The Executive Council may consider applications for membership on special terms as to subscriptions and otherwise. This rule is intended to apply in particular to local and other small voluntary associations wishing to become Corporate Members.

Associates—Any sum that is less than the appropriate subscription for membership.

Donations—The Society will be pleased to receive single or annual donations for any amounts from non-members.

Publications — Annual subscriptions may be made for *Smokeless Air* and for other publications as issued.

Payment of Subscriptions—The first subscription should be forwarded with application for membership. This may be sent at any time, and the subscription remains in force until the first day of the corresponding month of the following year. It is mutually advantageous if subscriptions are made by Banker's Order.

Covenant Donations—Annual contributions to the Society may be made under covenant, the Society being recognized as a "charity" by the Commissioners of Inland Revenue for this purpose. By signing an agreement to subscribe a stated sum for a period of at least seven years the Society may claim the amount of income tax that has been paid on such contributions, thereby increasing the benefit it receives without additional cost to the donor. Further particulars and form of covenant will be forwarded on request.

Representatives and Delegates

Local authority and Corporate Members are entitled to appoint Representatives to exercise on their behalf the rights of membership with regard to nomination for office, voting, receipt of publications, etc. Corporate Members may appoint one or two representatives each, according to subscription, and Local Authority Members a number according to population, as follows:

Less than 100,000	..	..	2
100,001 to 250,000	..	..	3
250,001 to 500,000	..	..	4
500,001 and over	..	..	5

Note: The Delegates mentioned previously participate in the activities of the Society *only* at Divisional level. A member's Representative exercises all the rights to which a member is entitled.

The names and addresses of Representatives should be forwarded on making application for membership, so that they may be entered in the Voting Registers.

Services to Members

Information and Advice

Advice, assistance and information on matters relating to atmospheric pollution and its prevention is available free of charge to Members, provided that, where necessary, the request is approved by the Executive Council. If the information required is not immediately available to the

Society's Information Department, the Society is prepared, on behalf of a Member, to obtain it from one of the specialized Information Bureaux.

Library

The Society's Library is available for the use of all Members. It possesses classified files of Press cuttings, and an extensive collection of both British and foreign books, reports and pamphlets on air pollution and related subjects. In some cases, the Society is the only organization in the United Kingdom receiving the publication. Books and other publications are issued on loan, or may be consulted in the Society's offices. The Society is linked with various specialist and technical libraries, and when a publication relating to some special aspect of air pollution is not in the library, the Society can often borrow it through other sources. Applications should be made initially to the Librarian.

Lectures

The Society will be pleased to help members and others in any part of the country to arrange lectures and talks of all kinds on atmospheric pollution and related subjects. A panel of speakers, arranged regionally, is being prepared and will be supplied on request.

Films

The Society does not possess films or film strips for loan, but a comprehensive list of films available from other sources is given elsewhere in this Year Book.

Exhibitions

The Society is ready to consider participating in exhibitions, and has a supply of display material and portable exhibition units for loan.

Demand for this material is heavy particularly in spring and autumn, and it is essential that inquiries should be made as early as possible in advance.

No charge is made for the loan of the material other than the cost of carriage.

Publicity Advisory Service

The Society's Publicity Advisory Service is available to help Local Authorities and Corporate Members with their Clean Air Publicity, especially when Smoke Control Orders are pending.

The Service advises members on display material, its arrangement for exhibitions, stands, etc., and supplies information on other publicity activities such as public meetings, local press features and correspondence, educational work in schools, women's organizations, etc.

No charge is made for this service to members.

Exhibition Display Material

The Society has an exhibition display unit available for loan by local authorities and corporate members. Known as the "Speedframe Display", it consists of metal tubes which can be built up into a number of different shaped free-standing displays, to which are attached 30 ins. x 24 ins. display panels. The display comprises of eight panels as follows:

Clean Air and Health
Clean Air and the Home
Clean Air and the Cost of Living
Clean Air and Industry
Clean Air and the Vehicle
Clean Air and the Future
and two plain coloured panels

The complete display measures 10 ft. x 2 ft. x 7 ft. and incorporates a 2 ft. x 2 ft. table for literature. It requires ten travelling cases to transport and will be sent by rail or road service vehicles.

In addition the following framed information panels under perspex are available:

I.P. 1—I.P. 4, Death in a London Fog, Why have soot with your custard? (Attack on Plant Life, and Holiday Resort), the following new framed panels under perspex are now available: (Size 30ins. x 20ins. except where stated.)

I.P.6 *Smoke Damages Stonework*—Illustrations of St. Paul's Cathedral before and after cleaning.

I.P.7 *Smoke Harms the Countryside*—Illustrations of the effect of pollution on vegetation.

I.P.8 *Smoke is Injurious to Health.*—Illustrations of clean and dirty lungs.

I.P.9 *Pollution from Road Vehicles*—Illustrations of the menace created by both petrol- and diesel-engined vehicles.

I.P.10 *Pollution from Industry*—Contrasting pictures of smoke-producing factory chimneys and a model, no-smoke industrial plant.

I.P.11 *The Problem of Sulphur Dioxide*—Photographs show the effect of SO_2 on iron railings and on leather-bound books (illustrated above).

I.P.12 *Smokeless Zones Mean Cleaner Air*—Contrasting pictures of a city in a Black area with a new housing estate in a smoke-controlled area (illustrated above).

Posters

The Society has a number of coloured and line posters available, ranging in price from 1s. 9d. per copy (double crown) to £7 10s. per 100 copies (with a reduction for Members). Crown line posters cost 8d. per copy to £2 8s. for 100 copies.

The full list of posters available is as follows:

2. *Clean Air is Your Affair*
4. *Prevent Air Pollution—Britain's Biggest Headache*
5. *Smokeless Zones—Cleaner Homes*
6. *Away with Smoke—Let in the Light*
9. *These are the Things that Smoke Does.*

10/11. *For Clean Air*—Posters designed for local overprinting (Double Crown and Crown sizes available).

Wall Chart

For school use. 44 ins. x 25 ins. (2s. including Lecture Notes.) From Educational Productions Ltd., 17 Denbigh Street, London, S.W.1.

Literature

Inquiries are invited on the supply of publications, give-away leaflets, etc., for special purposes. Particulars of these are given below and also in the Society's "Guide to Publications", on another page.

(1) "Descriptive Summary of the Clean Air Act." 6d. per single copy (by post 8d.) 4s. 6d. per dozen, or £1 10s. per 100.

(2) "Clean Air Begins at Home". 15s. per 100, or £6 per 1,000.

(3) "Smoke Affects Your Health & Your Wealth." 15s. per 100, or £6 per 1,000.

(4) Clean Air Bookmarks—4s. per 100, 30s. per 1,000.

(5) Clean Air: Notes for Teachers and Lecturers. 1s. 6d. (1·10) per copy 15s. 6d. per dozen.

(6) Fumifugium 2s. 6d. (3s.).

(7) Sulphur Dioxide 2s. (2s. 6d.).

(8) Air Pollution from Road Vehicles 3s. (3s. 6d.).

Photographs

The Society has a classified and indexed collection of smoke and other photographs, which are suitable for reproduction and/or exhibition purposes.

New photographs of high pictorial quality, in colour and covering a wide range of air pollution control subjects have now been acquired by the Society. Prints may be inspected at the Society's offices, or a selection will be sent by post if details of requirements are given. The copyright in the photographs is retained by the photographer, and where reproduction fees are chargeable, the inquirer should communicate with the photographer.

Summary of Divisional Accounts
For the year ended 31 December, 1968

	Balance 1 January 1967			*Grants*			*Other Income*			*Expenditure*			*Balance 31 December 1967*		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Scotland	190	5	9	100	0	0	288	14	9	399	0	0	180	0	6
Northern Ireland ..	61	10	9	30	0	0	150	17	0	218	0	11	24	6	10
North West	24	9	5	175	0	0		—		164	6	9	35	2	8
North East	44	14	10		—			16	0	17	13	9	27	17	1
Yorkshire	59	14	1	40	0	0		—		49	9	3	50	4	10
West Midlands	123	14	4	65	0	0		—		38	9	8	150	4	8
East Midlands	24	7	7	75	0	0		—		61	5	4	38	2	3
South West	9	19	0	75	0	0		—		25	15	1	59	3	11(*a*)
South East	8	5	7	120	0	0		—		106	17	5	21	8	2
South Wales & Mon. ..	71	9	4	20	0	0		—		13	17	8	77	11	8
Totals ..	618	10	8	700	0	0	440	7	9	1,094	15	10	664	2	7

Notes: (*a*) Statement for period 1 April to 31 December, 1967.

NATIONAL SOCIETY FOR CLEAN AIR

(Limited by Guarantee—Incorporated 1 January, 1958)

Balance Sheet as at 31 December, 1967

1966 £		£	£
	GENERAL FUND		
20,118	Balance at 1 January, 1967	20,087	
—	*Add:* Surplus for the year	—	
31	*Less:* Deficit for the year	1,321	
20,087			18,766
	PREMISES RESERVE FUND		
4,667	Balance at 1 January, 1967	4,667	
—	*Add:* Transfer from Income and Expenditure Account	—	
4,667			4,667
	JOHN STANLEY SEVERS LEGACY FUND		
3,187	Balance at 1 January, 1967	2,187	
1,000	*Less:* Transfer to Information and Publicity Services Account	1,000	
2,187			1,187
	CURRENT LIABILITIES		
1,978	Sundry Creditors and Accrued Expenses	2,144	
400	Bank Overdraft	—	
2,378			2,144
£29,319			£26,764

1966 £		£	£
	FIXED ASSETS		
—	Office Equipment and Furniture		Not Valued
	INVESTMENTS, AT COST		
2,804	Government and Corporation Stocks . .	4,149	
4,120	Other Fixed Interest Stocks	3,270	
14,248	Ordinary Shares	13,644	
21,172			21,063
	(Market Value 31.12.66 £19,090) (Market Value 31.12.67 £23,754)		
	CURRENT ASSETS		
427	Stock of Posters, Charts, etc. at Valuation . .	385	
3,212	Sundry Debtors and Prepayments . .	3,915	
	Bank Balances:		
4,454	Deposit Account	843	
—	Current Account	453	
54	Cash in Hand	105	
8,147			5,701
£29,319			£26,764

Stanley E. Cohen, *Honorary Treasurer*
Arnold Marsh, *Director and Secretary*

REPORT OF THE HONORARY AUDITORS TO THE MEMBERS OF THE NATIONAL SOCIETY FOR CLEAN AIR

We have obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of our Audit. In our opinion proper books of account have been kept by the Society so far as appears from our examination of those books. We have examined the Balance Sheet and annexed Income and Expenditure Account which are in agreement with the books of account. In our opinion and to the best of our information and according to the explanations given us the said accounts give the information required by the Companies Act, 1948, in the manner so required and the Balance Sheet gives a true and fair view of the state of the Society's affairs as at 31 December, 1967, and the Income and Expenditure Account gives a true and fair view of the deficit for the year ended on that date.

GEO. LITTLE SEBIRE & CO., *Chartered Accountants,*
Adelaide House, London Bridge, London, E.C.4. *Hon. Auditors.*

16 February, 1968

Income and Expenditure Account for the year ended 31 December, 1967

1966 £	EXPENDITURE	£	£
11,094	Salaries and Wages		11,697
2,455	Staff Pension Scheme		2,078
1,960	Rent, Rates, Light and Heat		2,029
2,016	Travelling, Insurance, Cleaning and General Expenses		2,891
76	Office Equipment and Furniture		427
522	Stationery and Supplies		606
	Smokeless Air and *Year Book:*		
3,515	Printing, Postage, etc.	3,569	
2,812	*Less:* Receipts from Advertisements	2,964	
703			605
	Information and Publicity Services and Cost of		
1,805	Publications	2,058	
1,000	*Less:* Amount paid from John Stanley Severs Legacy	1,000	
805			1,058
615	Divisional Grants		700
102	Loss on Sale of Investments (Net)		255
£20,348			£22,346

1966 £	INCOME	£	£
14,008	Subscriptions and Donations		14,746
12,246	Conference fees	4,601	
12,190	*Less:* Expenses	3,875	
56			726
9,546	Exhibition Income	6,185	
6,429	*Less:* Expenses	4,035	
3,117			2,150
1,322	Sales of Publications		2,009
	INVESTMENT INCOME		
859	Taxed Dividends (Net)	1,021	
448	Income Tax Repayment	304	
457	Bank Deposit Interest	69	
1,764			1,394
50	Premium on Conversion of 4½% Defence Bonds		—
20,317			21,025
	EXCESS OF EXPENDITURE OVER INCOME		
31	Transferred to General Fund		1,321
£20,348			£22,346

Subscriptions and Donations

for the year ended 31st December, 1967

* Denotes Covenant Donor

(2) denotes two Subscriptions received during the year

Scottish Division

	£	s.	d.
Airdrie Corporation	8	8	0
Ayr County Council	5	0	0
*Barclay-Smith, Lt. Col. E. A.	1	1	0
Barrhead Corporation	6	6	0
Broadbent, Mr. J.	2	0	0
Clackmannan County Council	8	8	0
Clydebank Corporation	10	10	0
Coatbridge Corporation	10	10	0
Cooper, Mr. F. T.	1	1	0
Currie, Mr. T. S.	1	1	0
Dumbarton Corporation	6	6	0
Dumfries Corporation	8	8	0
Dunbarton County Council	26	5	0
Dundee Corporation	26	5	0
East Kilbride Development Corpn.	7	7	0
East Kilbride Corporation (2)	16	16	0
Edinburgh Corporation	37	16	0
Falkirk Corporation	8	8	0
Fife County Council	26	5	0
Francis, Mr. S. H.	1	1	0
Gibb, Dr. W.	1	1	0
Glasgow Corporation	50	8	0
Glasgow Tree Lovers' Society	1	1	0
Grangemouth Corporation	6	6	0
Grattidge, Mr. H. H.	1	1	0
Hamilton Corporation	4	4	0
Hawick Corporation	6	6	0
*Horne, Dr. W. A.	12	12	0
Howden, James & Co. Ltd.	26	5	0
Hughes, Mr. H. S.	1	1	0
Hunter, Mr. R. (2)	2	2	0
Innes, Mr. J.	1	1	0
Inverness County Council	10	10	0
Inverness Corporation	8	8	0
Irvine Corporation	6	6	0
Irvine, Mr. J. H.	1	1	0
Johnstone Corporation	6	6	0
Kilmarnock Corporation	8	8	0
Kilsyth Corporation	6	6	0
Kirkcaldy Corporation	10	10	0
Kirkintilloch Corporation	6	6	0
Lanark County Council	37	16	0
Laurie, Mr. G.		5	0
Motherwell & Wishaw Corporation	10	10	0
North of Scotland Hydro-Electric Board	15	15	0
Paisley Corporation	15	15	0
Perth County Council	3	3	0
Perth Corporation	8	8	0
Renfrew County Council	12	12	0
Renfrew Corporation	6	6	0
*Renwick, Dr. and Mrs. J.	1	0	0
*Ritchie, Mr. G. B.	1	1	0
Rothesay Corporation	6	6	0
Royal Sanitary Assoc. of Scotland	15	15	0
Rutherglen Corporation	6	6	0
Slimming, Mr. D. W.	1	5	0
Smith & Wellstood Ltd.	1	1	0
South of Scotland Electricity Board	50	0	0
Stewart, Mr. G. N.	1	1	0
Sterling County Council	26	5	0
Sterling Corporation	8	8	0
Strump, Mr. G.		10	6
Tucker, Mr. P.	1	1	0
Waldie & Cameron Ltd.	1	1	0
Wallace, Mrs.		15	0
West Lothian County Council	8	8	0
Wightman, Mrs. U. N.	1	1	0

Northern Ireland Division

	£	s.	d.
Antrim County Council	5	5	0
Antrim R.D.C.	8	8	0
Ballymena Corporation	6	6	0
Belfast Corporation	37	16	0
Carey, Dr. G. C. R.	1	1	0
Carrickfergus Corporation	6	6	0
Coal Advisory Service	15	15	0
Davidson & Co. Ltd.	15	15	0
Dunbar, Mr. H.	1	1	0
Edwards, Dr. M. D.	1	1	0
Edwards, Mr. T. G.	1	1	0
Electricity Board for Northern Ireland	15	15	0
*Ellison, Mr. C. A.	1	10	0
Guinness, A. Son & Co. Ltd.	15	15	0
Heywood, Mr. T. H.	1	1	0
Hinchliff, Mr. D.	1	1	0
Hood, Mr. N. R. S.	1	1	0
Jenkins, Major W.	1	1	0
Knox, Dr. E. W.	1	1	0
Londonderry Corporation	10	10	0
Lynas, Mr. K. H.	1	10	0
Magee, Mr. J. L.	1	1	0
McAlery, Cllr. Miss I. M. E.	1	1	0
Millar, Mr. J.	1	1	0
Muske, Mr. W. J.	1	1	0
Northern Ireland Electrical Development Association	15	15	0
O'Brien, Mr. W. E. C.	1	5	0
Ormeau Bakery Ltd.	15	15	0
Peel, Mr. R.	1	1	0
Pemberton, Professor J.	1	1	0
Portadown Corporation	6	6	0
Porter, Colonel H. J.	2	2	0
Reynolds, Mr. A.	1	10	0

North West Division

Abram U.D.C.	6	6	0
Accrington Corporation	8	8	0
Affleck & Brown Ltd.	2	2	0
Altringham Corporation	8	8	0
Amende, Mr. H. F.	1	0	0
Ashton Bros. & Co. Ltd.	2	2	0
Ashton in Makerfield U.D.C.	6	6	0
Ashton under Lyne Corporation (2)	21	0	0
Atherton U.D.C.	6	6	0
Audenshaw U.D.C.	6	6	0
Bacup Corporation	6	6	0
Barrow in Furness Corporation	10	10	0
Bayes, Ald. Mrs. M.	3	0	0
*Beard, Mr. E.	2	17	0
Beattie Ltd., Messrs. E. & F.	1	1	0
Bebington Corporation	10	10	0
Behrens, Mr. A.		10	0
Bibby, Mr. H. P.	2	2	0
Bibby, J. & Sons Ltd.	15	15	0
Birkenhead Corporation	2	2	0
Blackburn Corporation	26	5	0
Blackpool Corporation	26	5	0
Bolton Corporation	26	5	0
Bootle Corporation	12	12	0
Bredbury & Romiley U.D.C.	6	6	0
Brierfield U.D.C. (2)	12	12	0
British Insulated Callender's Cables Ltd.	15	15	0
*Brown, Mr. P. S.	1	1	0
Bucklow R.D.C.	6	6	0

	£	s.	d.
Burnley Corporation	15	15	0
Bury Corporation	10	10	0
Buxton Corporation	6	6	0
Cass, Mr. H. V.	1	1	0
Chadderton U.D.C.	8	8	0
*Chantler, Mr. P.	4	4	0
Cheadle & Gatley U.D.C.	8	8	0
Cheshire County Council	50	8	0
Chester R.D.C.	8	8	0
Chorley Corporation	8	8	0
Church U.D.C.	6	6	0
Clitheroe Corporation	3	3	0
Clusky, Mr. H.	1	1	0
Coal Merchants' Federation of Great Britain	26	5	0
Colne Corporation	6	6	0
Community Council of Lancashire	2	2	0
Connah's Quay U.D.C.	6	6	0
Cooper, Miss I.	1	1	0
Cotton, Cllr. S. A.	1	1	0
Coulthard, Miss D.	1	1	0
Crewe Corporation	10	10	0
Crompton U.D.C.	6	6	0
Crosby Corporation	3	3	0
Cumberland County Council	5	0	0
Darwen Corporation	8	8	0
Dearden, Mr. and Mrs. J.	3	0	0
Denton U.D.C.	8	8	0
District Bank (Anonymous)	20	0	0
Droylsden U.D.C.	8	8	0
Duguid, Mr. S.	2	2	0
Duguid, Mrs. S. N.	1	1	0
Dunkinfield Corporation	6	6	0
Eccles Corporation	8	8	0
Ellesmere Port Corporation	8	8	0
Failsworth U.D.C.	6	6	0
Fallows, Mr. W. B.	1	1	0
Farnworth Corporation	8	8	0
Farquharson, Mr. G. W.	1	1	0
Federation of Owner Occupiers' and Owner Residents' Association Ltd.	3	3	0
Ferranti Ltd.	21	0	0
Fleetwood Corporation	8	8	0
Flint Corporation (2)	12	12	0
Forsyth, Mrs. L. A.	1	1	0
Franklin, Mr. E. J. (2)	2	2	0
Franklin, Mr. N. J.	1	1	0
Fulwood U.D.C.	6	6	0
Furness District Federation of Owner Occupiers' Association	2	2	0
Gee, Mr. J.	1	1	0
Gee, Mrs. J.	1	1	0
Gibbons, Mr. E. B. (2)	4	4	0
Glossop Corporation	6	6	0
Golbourne U.D.C.	6	6	0
Graham, Mrs. E. M.	1	1	0
*Graham, Mr. G. M. (2)	2	0	0
Great Harwood U.D.C.	6	6	0
Hale U.D.C.	6	6	0
Hall, Mr. A.	1	10	0
Hall, Mr. E. N.	1	1	0
Halliday, Mr. A. C.	1	10	0
Hallows, Mr. V. K.	1	1	0
Haslingden Corporation	6	6	0
Haydock U.D.C.	6	6	0
*Hayhurst, Mr. H.	1	1	0
Hazel Grove and Bramhall U.D.C.	6	6	0
*Heald, Dr. G. E.	1	1	0
Hendy, Dr. B.	1	1	0
Heywood Corporation	8	8	0
Hindley U.D.C.	6	6	0
Horwich U.D.C.	6	6	0
Howe, Mr. A. J.	1	1	0
Hoylake U.D.C.	5	5	0
Huyton with Roby U.D.C.	10	10	0
Hyde Corporation	8	8	0
Ince in Makerfield U.D.C.	6	6	0
Irlam U.D.C.	6	6	0
Jackson, Mr. C. L.	1	1	0
Jewsbury, Mr. S. (2)	2	2	0
Kearsley U.D.C.	6	6	0
*Keddie, Dr. J. T. C.	1	1	0
Kerr, Mr. J.	3	3	0
Kirk, Mr. W. R.	1	1	0
Kirkby U.D.C.	10	10	0
Kitchener, The Rt. Hon. The Earl	1	0	0
Lancashire County Council	52	10	0
Lancashire & District Coke Distributors' Association	26	5	0
Lancaster Corporation	8	8	0
Lane, Mrs. W.	1	1	0
Langford, Mr. A. S.		10	6
*Leech, Dr. P. W.	1	1	0
Lees U.D.C.	6	6	0
Lees, Miss M.	1	1	0
Leigh Corporation	8	8	0
Leyland U.D.C.	6	6	0
Littleborough U.D.C.	6	6	0
Liverpool Corporation	50	8	0
Longendale U.D.C.	6	6	0
McNicol, Miss M.		2	6
MacWilliam, Dr. H. H.		15	0
Macclesfield Corporation	8	8	0
Manchester Corporation	50	8	0
Manchester & District Regional Clean Air Council	15	15	0
Marple U.D.C.	6	6	0
Martindale, Mr. R. L.	1	1	0
Mather & Platt Ltd.	50	0	0
*Mather, Mr. W. L.	1	0	0
Matlock U.D.C.	6	6	0
Mercer & Sons Ltd.	1	1	0
Merseyside & North Wales Electricity Board	49	0	0
Middleton Corporation	10	10	0
Middlewich U.D.C.	6	6	0
Mitchell, Mr. L. A.	1	1	0
Mold U.D.C.	6	6	0
Moore, Mr. H. (2)	2	2	0
Morecambe & Heysham Corporation	8	8	0
Nantwich U.D.C.	6	6	0
Nelson Corporation	8	8	0
Newton le Willows U.D.C.	6	6	0
Northern Gas Board (Carlisle) (2)	3	13	6
Northern Gas Board (Penrith) (2)	1	1	0
Northern Gas Board (Workington) (2)	3	3	0
North Western Electricity Board	75	0	0
North Western Gas Board (2)	210	0	0
Northwich R.D.C.	8	8	0
Northwich U.D.C.	6	6	0
*Norwood, Mrs. D. B.	1	1	0
Oldham Corporation	26	5	0
Ormskirk U.D.C.	6	6	0
Pennington, Mr. H.	1	1	0
Pike, Miss I. M.	1	1	0
Polding, Mr. W. W.		10	6
Pollitt, Mr. W. E.	1	1	0
Preston Corporation	26	5	0
Preston R.D.C.	8	8	0
Prestwich Corporation	8	8	0
Radcliffe Corporation	8	8	0
Rae, Cllr. K. F.	1	1	0
Ramsbottom U.D.C.	6	6	0
Rawtenstall Corporation	8	8	0
Refuge Assurance Co. Ltd.	12	12	0
Rhyl U.D.C.	6	6	0
Richards, Mr. J. E.	1	1	0
Riston U.D.C.	2	2	0
Rochdale Corporation	15	15	0
Roper, Mr. J. F. H.	1	10	0
Royton U.D.C.	6	6	0
Runcorn R.D.C.	8	8	0
Runcorn U.D.C.	8	8	0
St. Helens Corporation	26	5	0
Sale Corporation	8	8	0
Salford Corporation	26	5	0
Shaw, Mrs. M.	1	1	0
Simon-Carves Ltd.	100	0	0
Skelmersdale U.D.C.	6	6	0
Smith, Cllr. W. (2)	2	2	0
South East Lancashire & North Cheshire Consultative Committee for the Investigation of Atmospheric Pollution	2	2	0

	£	s.	d.
Southport Corporation	1	1	0
Stalybridge Corporation	6	6	0
Standish with Langtree U.D.C.	6	6	0
Stanyard, Mr. R. J.	1	1	0
Stockport Corporation	26	5	0
Stretford Corporation	10	10	0
Summers, John & Sons Ltd.	26	5	0
Swinton & Pendlebury Corporation	8	8	0
Taylor, Mrs. A. E.	1	1	0
Taylor, Mr. A.	1	1	0
Taylor, Mrs. E.	1	1	0
Taylor, Mr. S.	1	1	0
Taymar Ltd.	2	2	0
Thomas, Mr. F. L.	1	1	0
Thornton Cleveleys U.D.C.	5	5	0
Thorpe, Mr. J. A.	1	1	0
Tillotsons Newspapers Ltd.	15	15	0
Tintwistle R.D.C.	2	2	0
Topham, Mrs. D. A.	1	1	0
Tyldesley U.D.C.	6	6	0
Up Holland U.D.C.	6	6	0
*Vanstone, Mr. H. B.	1	16	0
Viney, Mr. N. H.	1	1	0
Wallasey Corporation	26	5	0
Ward, Mr. A. G.	1	1	0
Warren, Mr. D.	1	1	0
Warrington Corporation	15	15	0
Warrington Local Medical Committee	2	2	0
Warrington R.D.C.	2	2	0
West Lancashire R.D.C.	1	1	0
Whiston R.D.C.	8	8	0
Whitefield U.D.C.	6	6	0
Whitworth U.D.C.	6	6	0
Widnes Corporation	10	10	0
Wigan Corporation	15	15	0
*Williams, Mr. W. B.	1	0	0
Williamson, Mr. J. G.		15	0
Wilmslow U.D.C.	6	6	0
Winsford U.D.C.	8	8	0
Wood, Mrs. C.	1	1	0
Workington Corporation	8	8	0
Worsley U.D.C.	8	8	0
Wrexham Corporation (2)	18	18	0
Wrexham R.D.C.	10	10	0

North East Division

	£	s.	d.
American Air Filter (Gt. Britain) Ltd.	15	15	0
*Angus, Col. E. G.	3	3	0
Ashington U.D.C.	8	8	0
*Atkinson, Mr. E.		15	0
Atkinson, Mr. H.		15	0
Barnard Castle R.D.C.	6	6	0
Bedlingtonshire U.D.C.	8	8	0
Billingham U.D.C.	6	6	0
Bishop Aukland U.D.C.	8	8	0
Blaydon U.D.C.	8	8	0
Bradley, Mr. R. M.	1	1	0
Brandon & Byshottles U.D.C.	6	6	0
*Calvert, Mrs. M. R.	1	10	0
Carr, Mr. W.	1	1	0
Castle Ward R.D.C.	6	6	0
Chester le Street R.D.C.	8	8	0
Chester le Street U.D.C.	6	6	0
Consett U.D.C.	8	8	0
Crook & Willington U.D.C.	8	8	0
Darlington Corporation	7	7	0
Durham R.D.C.	8	8	0
Eston U.D.C.	8	8	0
Felling U.D.C.	8	8	0
Gateshead Corporation	26	5	0
Gosforth U.D.C.	6	6	0
Hartlepool Corporation	15	15	0
Head Wrightson & Co. Ltd.	15	15	0
Head Wrightson Iron & Steel Works Engineering Ltd.	26	5	0
Hebburn U.D.C.	6	6	0
Hetton U.D.C.	6	6	0
Houghton le Spring U.D.C. (2)	16	16	0
Imperial Chemical Industries Ltd.	15	15	0
*Isaac, Prof. P. C. G.	2	0	0
Jarrow Corporation	8	8	0
Lanchester R.D.C.	6	6	0
Longbenton U.D.C.	16	16	0
Middlesbrough Corporation	26	5	0
Newburn U.D.C.	8	8	0
Newcastle Regional Hospital Board	15	15	0
Newcastle upon Tyne Corporation	37	16	0
North Eastern Electricity Board	43	0	0
Northern Coke Distributors' Association	15	15	0
Northern Gas Board (Darlington) (2)	6	6	0
Northern Gas Board (Blyth) (2)	2	2	0
Northern Gas Board (Hexham) (2)	1	1	0
Northern Gas Board (Middlesbrough) (2)	8	8	0
Northern Gas Board (Newcastle on Tyne) (2)	42	0	0
Northern Gas Board (Stockton on Tees) (2)	8	8	0
Northern Gas Board (Sunderland) (2)	8	8	0
Northumberland County Council	37	16	0
*Ogilvie, Dr. A. G.	1	1	0
Orchard, Mr. G. W.	1	1	0
Redcar Corporation	8	8	0
Ryton U.D.C.	6	6	0
Saltburn & Marske by the Sea U.D.C.	6	6	0
Seaham U.D.C.	8	8	0
Sedgefield R.D.C.	8	8	0
Shildon U.D.C.	6	6	0
Skelton & Brotton U.D.C.	6	6	0
Smith, Mr. R. D.	1	1	0
South Shields Corporation	26	5	0
Spennymoor U.D.C.	6	6	0
*Spriggs, Dr. E. A.	1	1	0
Stanley U.D.C.	8	8	0
Stockton on Tees Corporation	2	12	6
Tate, Mr. G. W. (2)	2	2	0
Thomas, Mr. D. M. C.	1	1	0
Thornaby on Tees Corporation	6	6	0
Tynemouth Corporation	10	10	0
University of Newcastle upon Tyne (2)	6	6	0
Wallsend Corporation	8	8	0
Washington U.D.C.	6	6	0
Whitley Corporation	8	8	0

Yorkshire Division

	£	s.	d.
Adwick le Street U.D.C.	6	6	0
Aireborough U.D.C.	8	8	0
Armitage, Mr. F.	1	1	0
Barnsley District Coking Co. Ltd.	15	15	0
Batley Corporation	8	8	0
Bentley with Arksey U.D.C.	6	6	0
Bingley U.D.C.	6	6	0
Boyd, Miss A. D.	1	1	0
Bradford Corporation	37	16	0
Bradford Civic Society	3	3	0
Bridlington Corporation	8	8	0
Brighouse Corporation	8	8	0
Brown, Mr. G. L.	2	2	0
Burn, Dr. A. T.	1	1	0
Castleford Corporation	8	8	0
Clayton, Son & Co. Ltd.	2	2	0
Coke Oven Managers' Association (2)	10	10	0
Colne Valley U.D.C.	6	6	0
Conisbrough U.D.C.	6	6	0
Cudworth U.D.C.	6	6	0
Darton U.D.C.	6	6	0
Dearne U.D.C.	6	6	0
Denby Dale U.D.C.	6	6	0
Dewsbury Corporation	10	10	0
Doncaster Corporation	15	15	0
Doncaster R.D.C.	10	10	0
Elland U.D.C.	6	6	0
Etherington, Mr. H.	1	1	0
Fleming, Mr. I.	1	1	0
Gifford, Dr. P. W. W.	1	1	0
Goodfellow, Mr. J.	1	1	0
Hackney, Mr. E. S.	1	1	0
Halifax Corporation	15	15	0

	£	s.	d.
Hall, Mr. J. A. (2)	2	2	0
Harrogate Corporation	10	10	0
Heckmondwike U.D.C.	6	6	0
Hemsworth R.D.C.	10	10	0
Hemsworth U.D.C.	6	6	0
Henderson, Mr. W.	1	1	0
Hepton R.D.C.	6	6	0
Holmes, W. C. & Co. Ltd.	26	5	0
Holmfirth U.D.C.	6	6	0
Horbury U.D.C.	6	6	0
Horsforth U.D.C.	6	6	0
Hoyland Nether U.D.C.	6	6	0
Huddersfield Corporation	26	5	0
*Hutton, Dr. K. B.	10	0	0
Ilkley U.D.C. (2)	12	12	0
Jervis, Dr. J. J.	1	1	0
Jones, Mr. L.	1	1	0
Jordan, Mr. H. H.	1	1	0
Keighley Corporation	2	2	0
Kingston upon Hull Corporation	37	16	0
Knottingley U.D.C.	6	6	0
Leeds Corporation	50	8	0
Machen, Mr. C.	1	1	0
*Marshall, Mr. G. C.	1	5	0
McLintock, Dr. S. W.	1	1	0
Meltham U.D.C. (2)	12	12	0
Middlebrook, Mr. C. J.	1	1	0
Mirfield U.D.C.	6	6	0
Moore, Mr. L.		15	0
Morley Corporation (2)	16	16	0
Normanton U.D.C.	6	6	0
North Eastern Coke Distributors' Association	15	15	0
North Eastern Gas Board	42	0	0
North Riding of Yorkshire County Council	37	16	0
Nu-Swift International Ltd.	25	0	0
Ossett Corporation	6	6	0
Otley U.D.C.	6	6	0
Park Gate Iron & Steel Co. Ltd.	26	5	0
Pontefract Corporation	8	8	0
Pudsley Corporation	8	8	0
Queensbury & Shelf U.D.C.	6	6	0
Rawmarsh U.D.C.	6	6	0
Rothwell U.D.C.	8	8	0
Rotherham Corporation	15	15	0
Royston U.D.C.	6	6	0
Rushton, Mr. J. L.	1	1	0
Scarborough Corporation	2	2	0
Scargill, Mr. M.	1	1	0
Sharp, Mr. A. I.	1	1	0
Shaw, Mr. D.	1	1	0
Sheffield & District Clean Air Committee	50	8	0
Shipley U.D.C.	8	8	0
Skinningrove Iron Co. Ltd.	10	0	0
Skipton U.D.C.	6	6	0
Slater, Mr. D. J.	1	1	0
Sowerby Bridge U.D.C.	6	6	0
Spenborough Corporation	8	8	0
Steam Storage Co. Ltd.	1	1	0
Swinton U.D.C.	6	6	0
Thorne R.D.C.	8	8	0
Todmorden Corporation	6	6	0
Tuckley, Miss B. E.	1	1	0
*Underwood, Dr. G.	1	1	0
United Steel Companies Ltd.	50	0	0
Universal Machinery & Services Ltd.	15	15	0
Wakefield R.D.C.	6	6	0
Wakefield Corporation	10	10	0
Walden, Mr. K. H.	1	1	0
Wath upon Dearne U.D.C.	6	6	0
West Riding Clean Air Advisory Council	5	5	0
Whickham U.D.C.	6	6	0
Wilson, Mr. H.	1	1	0
Wombwell U.D.C. (2)	12	12	0
Wood, Mr. F. T.	1	1	0
Worsbrough U.D.C.	6	6	0
Wortley R.D.C.	8	8	0
York Corporation	5	5	0
Yorkshire Electricity Board	81	0	0

West Midlands Division

	£	s.	d.
Aldridge Brownhills U.D.C.	15	15	0
Atherstone R.D.C.	8	8	0
Barnes, Mr. A. J.	1	1	0
Barnes, Mrs. E. M.	1	1	0
Bedworth U.D.C.	8	8	0
Birmingham Corporation	50	8	0
Burton upon Trent Corporation	10	10	0
Cadbury Brothers Ltd.	15	15	0
Cannock R.D.C.	8	8	0
Cannock U.D.C.	8	8	0
Cradley Boiler Co. Ltd.	15	15	0
Danks, E. & Co. (Oldbury) Ltd.	15	15	0
Dickinson, Mr. S.	1	1	0
Dingley, Ald. W. L.	1	1	0
Donaldson, Mr. I. J.	1	1	0
Dudley Corporation (2)	26	5	0
Fletcher, Mr. J. P.	1	5	0
Garner, Mr. N. A.	1	1	0
Gibbons Brothers Ltd.	25	0	0
Gimson, J. & Co. Ltd.	15	15	0
Gittins, Mr. M. J.	1	1	0
Guest, Keen & Nettlefold Ltd.	50	0	0
Halesowen Corporation	8	8	0
Hereford Corporation	8	8	0
Hockton, Mr. D.	2	0	0
Kidderminster Corporation	8	8	0
Leamington Spa Corporation (2)	16	16	0
Lichfield R.D.C.	8	8	0
Longley, Mr. J. C. (2)	2	2	0
Lowbridge, Mr. H. E. T.	1	1	0
Magness, Cllr. F. V.	1	1	0
Martine, Dr. W. R.	1	1	0
Meriden R.D.C.	10	10	0
Midland Counties Coke Distributors' Association	15	15	0
Midland Electricity Board	81	0	0
Midlands Joint Advisory Clean Air Council	01	10	0
Moore, Mr. J.	1	1	0
Newcastle under Lyne Corporation	15	15	0
Nuneaton Corporation	10	10	0
Nuneaton Fume Smoke & Noise Abatement Society	3	3	0
Owen, Mr. A. G.	1	1	0
Pate, Mr. A.	1	1	0
*Pringle, Dr. E.	1	1	0
Pringle, Dr. J. E.	1	1	0
Redditch U.D.C.	8	8	0
*Reynolds, Mr. K.	3	0	0
Rugby Corporation	8	8	0
Rugeley U.D.C.	6	6	0
Seisdon R.D.C.	2	2	0
Smart, Mr. R. C.		10	6
Solihull Corporation	15	15	0
Stafford Corporation	8	8	0
Staffordshire County Council	30	5	0
Steadman, Mr. A. T.	1	1	0
Stoke on Trent Corporation	37	16	0
Stone R.D.C.	6	6	0
Sutton Coldfield Corporation	10	10	0
Taylor, Mr. and Mrs. C. B.	2	2	0
Walsall Corporation	26	5	0
Waltho, Mr. R. B.	1	1	0
Ward, Mrs. M. G.	1	1	0
Warley Corporation	26	5	0
Warwick Corporation	6	6	0
Warwick R.D.C.	8	8	0
Warwickshire Clean Air Council	26	5	0
Warwickshire County Council	18	18	0
West Bromwich Corporation (2)	52	10	0
West Midlands Gas Board	105	0	0
Wolverhampton Corporation	37	16	0
Worcester Corporation	10	10	0

East Midlands Division

	£	s.	d.
Alfreton U.D.C.	6	6	0
Allison, Mr. G.	2	2	0
Ambrose, Mr. R. F.	2	0	0
Ballard, Mr. W. A.	1	1	0
Basford, R.D.C.	10	10	0

	£	s.	d.
Beeston & Stapleford U.D.C.	10	10	0
Belper R.D.C.	8	8	0
Belper U.D.C.	6	6	0
Bingham R.D.C. (2)	12	12	0
Blaby R.D.C.	8	8	0
Blackwell R.D.C.	8	8	0
Bolsover U.D.C.	6	6	0
Boston Corporation	6	6	0
*Brown, Mr. J. A.	1	1	0
Cambridge City	1	1	0
Carlton U.D.C.	8	8	0
Chesterfield Corporation	10	10	0
Chesterfield R.D.C.	10	10	0
Clay Cross U.D.C.	6	6	0
Coalite & Chemical Products Ltd.	400	0	0
Coalville U.D.C.	8	8	0
Cooper, Alderman S.	1	1	0
Corby U.D.C.	8	8	0
Crowther, Dr. J. S.	1	1	0
Darby, Mr. F. M.	1	1	0
Davies, Dr. D.	1	1	0
Derby Corporation	26	5	0
Dronfield U.D.C.	6	6	0
Eales, Mr. C. D.	1	1	0
Eastern Electricity Board	80	0	0
East Midlands Electricity Board	62	0	0
East Midlands Gas Board (2)	147	0	0
Eastwood U.D.C.	6	6	0
Ewart, Mr. E. S.	1	1	0
Ford, Mr. G. E. (2)	2	2	0
Gainsborough U.D.C.	6	6	0
Grantham Corporation	8	8	0
Great Yarmouth Corporation	10	10	0
Grimsby Corporation	15	15	0
Gurney, Mr. J.	7	0	0
Harrop, Mr. J. A.	2	0	0
Heanor U.D.C.	6	6	0
Hiller, Mr. G. A.	1	1	0
Hinckley U.D.C.	8	8	0
Ilkeston Corporation	8	8	0
Ipswich Corporation	26	5	0
Irthlingborough U.D.C.	6	6	0
Jackson, Mr. J. B.	1	1	0
Kettering Corporation	8	8	0
King's Lynn Corporation	8	8	0
Kirkby in Ashfield U.D.C.	6	6	0
Leicester Corporation	37	16	0
Lincoln City (2)	21	0	0
Lincoln County—Kesteven	10	10	0
Lincoln County—Lindsey	5	5	0
Long Eaton U.D.C.	8	8	0
Loughborough Corporation	8	8	0
Lowestoft Corporation	8	8	0
Low Temperature Coal Distillers Association of Gt. Britain	15	15	0
Mansfield Corporation	10	10	0
Mansfield Woodhouse U.D.C.	6	6	0
Needham, Mr. C. E.	2	0	0
Newark Corporation	6	6	0
Norwich Corporation	26	5	0
Nottingham Corporation (2)	75	12	0
Nottinghamshire County Council	10	10	0
Old Fletton U.D.C.	6	6	0
Page, Miss P.	1	1	0
Pane, Mr. R.	2	0	0
Pepperdine, Cllr. E. C.	1	1	0
Peterborough Corporation	10	10	0
*Pleister, Miss E. M. J.	1	1	0
Repton R.D.C.	2	2	0
Rushden R.D.C.	6	6	0
Scunthorpe Corporation	10	10	0
Smith, Lt. Col. C. H.	2	2	0
Southwell R.D.C.	8	8	0
Staveley U.D.C.	6	6	0
Stewarts & Lloyds Ltd.	50	0	0
Sutton in Ashfield U.D.C.	8	8	0
Swadlingcote U.D.C.	6	6	0
Turner, Miss H. E.	2	0	0
*Turner, Mr. T. H.	2	0	0
Wade, Mr. A.	1	1	0
Wearing, Mr. F. L.	5	5	0
Weldon, Miss G. M.	2	2	0
Wellingborough U.D.C.	3	3	0
Welton R.D.C.	6	6	0
Wilkinson, Mr. J. R.	1	10	0
Williams, Mr. E. V. H.	1	1	0
Wisbech Corporation	6	6	0
Worksop Corporation	8	8	0
Worksop R.D.C.	6	6	0
Wright, Mr. P. F. (2)	2	2	0

South West Division

	£	s.	d.
Bath Corporation	15	15	0
Bathavon R.D.C.		10	6
Best, Mr. J. K.	1	1	0
Blampied, Mr. F. C.	1	1	0
Bridgewater Corporation	1	1	0
Bristol Corporation	37	16	0
Crawley, Lady	3	0	0
Cheltenham Corporation	10	10	0
Chudley, Mr. J. C.	2	2	0
Colehan, Mr. J. E.	1	1	0
Collectron (Sales) Ltd.	15	15	0
Crook, Mr. S. C.	1	1	0
Draper, Mr. P.	1	1	0
Dursley R.D.C.	6	6	0
Gloucester Corporation	10	10	0
Greenwood, Mr. T. A. S.		15	0
Harris, Mr. J.	1	1	0
Imperial Tobacco Co. Ltd.	26	5	0
Keynsham U.D.C.	1	1	0
Kingswood U.D.C.	8	8	0
Lydney R.D.C.	6	6	0
Mangotsfield U.D.C.	1	1	0
Norton Radstock U.D.C.	1	1	0
Poole Corporation	15	15	0
Redstone, Mr. R. V.	1	1	0
Shepton Mallet R.D.C.		10	6
Shervourne U.D.C.	1	1	0
Sodbury R.D.C.	4	4	0
South Western Electricity Board	32	0	0
South Western Gas Board	36	15	0
Stroud U.D.C.	6	6	0
Swindon Corporation	15	15	0
Symonds, Mr. A. A.	1	1	0
Tetbury R.D.C.		10	6
Tewkesbury Corporation	2	2	0
Thornbury R.D.C.	8	8	0
Trevillion, Mrs. F.	1	0	0
Wakeley, Mr. R. W.	1	1	0
Weston Super Mare Corporation	2	2	0
West Penwith R.D.C.	6	6	0
Weymouth & Melcombe Regis Corporation	8	8	0
Whiting, Mr G C.	2	0	0

South East Division

	£	s.	d.
Abell, Mr. R. H.	1	1	0
Acworth, Miss E. A.	1	1	0
Acworth, Miss W. B.	5	5	0
Allied Iron Founders Ltd.	15	15	0
Ambuco Ltd.	15	15	0
Amersham R.D.C.	8	8	0
Armstrong, Mr. F. W.	1	0	0
Association of Public Health Inspectors	15	15	0
Ault, Mr. H.	1	1	0
Aylesbury Corporation	8	8	0
Bailey, Mr. H. D.	1	1	0
Barber, Mr. S. S.	1	1	0
Barking, London Borough of	26	5	0
Barnet, London Borough of	37	16	0
Bartlam, Mr. J. N.	2	2	0
Basildon U.D.C.	26	5	0
Bastable, Mr. N.	1	1	0
Beacon Villages Association	1	1	0
Beaumont, Mr. M.	2	2	0
Bedford Corporation (2)	21	0	0
Bedfordshire County Council	37	16	0

	£	s.	d.
Bexley, London Borough of	26	5	0
Bird, Mrs. E.	2	2	0
Bishop's Stortford U.D.C.	6	6	0
Bletchley U.D.C.	6	6	0
Bligh, Mrs. M. F.	1	1	0
Bognor Regis U.D.C.	2	2	0
Bonnell, Dr. J. A.	1	1	0
Bottom, Mr. D. W.	1	1	0
Boult, Sir Adrian C.	1	1	0
*Boult, Miss O.	1	1	0
Bournemouth Corporation	2	2	0
Bowen, Miss N.	1	1	0
*Boyd, Miss D.	1	1	0
*Bradbury-Williams, Mr. J. C.	1	1	0
Bradford, Mr. S. G.	1	1	0
Braintree R.D.C.	6	6	0
Brent, London Borough of	37	16	0
Brentwood U.D.C.	10	10	0
Brighton Corporation	26	5	0
British Iron & Steel Federation	350	0	0
British Medical Association	26	5	0
British Petroleum Co. Ltd.	100	0	0
Bromley, London Borough of	37	16	0
Brooks, Mr. J. F.	1	1	0
*Brown, Mr. A. W.	1	1	0
*Bryant, Miss P. M.	1	1	0
Buckle, G. H. & Partners	26	5	0
Buist, Commander C.	10	10	0
Bullingdon R.D.C.	8	8	0
Burke, Dr. S. A.	1	11	6
Butler, Mr. J. W.	2	2	0
Caller, Dr. S.		10	6
Calor Gas Distributing Co. Ltd.	15	15	0
Camden, London Borough of	26	5	0
Capes, Mr. F. B.		15	0
Card, Mr. H. T.	1	1	0
Carpenter, The Reverend V. A.		10	6
Carter, Dr. J. S.	4	4	0
Cave, Miss R.	1	1	0
Central Electricity Board	362	0	0
Charrington, Gardener, Lockett, & Co. Ltd.	15	15	0
Chatfield, Mr. A. J.	1	1	0
Chatham Corporation (2)	16	16	0
Chesham U.D.C.	6	6	0
Cheshunt U.D.C.	8	8	0
Chigwell U.D.C.	10	10	0
*Chivers, Mr. D. P.		15	0
Clacton U.D.C.	3	3	0
Clarke, Dr. R. T. V.	1	10	0
Clarke, Mr. S. H.	1	0	0
*Clinch, Mr. H. G.	1	1	0
Coal Utilisation Council	26	5	0
College of Fuel Technology	15	15	0
Courtier, Mr. G. B.	1	5	0
Cousin, Lt. Col. A. J.	1	1	0
Crawley U.D.C.	8	8	0
Crosby, Mr. A. S. B.	1	1	0
Croydon, London Borough of	10	10	0
Cuckfield R.D.C.	4	4	0
Curtis, Mr. B.	2	0	0
*Damon, Mr. W. A.	1	1	0
Dartford Corporation	8	8	0
Dartford R.D.C. (2)	16	16	0
Davies, Mr. P. M.	1	1	0
Davies, Mr. E. T. A.	1	1	0
Davis, Dr. J. B.	1	1	0
Dimbleby, Mr. T. E.	1	1	0
*Dobson, Mr. P. F.	1	1	0
Dover Corporation	8	8	0
Dray, Mr. F.	1	1	0
Drummond Dust & Fume Extractors Ltd.	15	15	0
Dust Suppression Ltd.	15	15	0
Ealing, London Borough of	37	16	0
*East, Mr. R. G.	1	1	0
Eastbourne Corporation	10	10	0
Eastern Gas Board	42	0	0
Easthampstead R.D.C.	10	10	0
Eastleigh Corporation	8	8	0
Easy Heating Co.	15	15	0
*Eaton, Dr. F. J.	3	10	0

	£	s.	d.
Ebben, Mr. G.	1	1	0
Egham U.D.C.	8	8	0
Electrical Association for Women	26	5	0
Electricity Council	363	0	0
Elstree R.D.C.	6	6	0
*Elsworthy, Mr. J. G.	2	2	0
Enfield, London Borough of	37	16	0
Epping & Ongar R.D.C.	8	8	0
Epsom & Ewell Corporation	10	10	0
Esher U.D.C.	10	10	0
Essex County Council	3	3	0
Esso Petroleum Co. Ltd.	150	0	0
Eton R.D.C.	10	10	0
Farnborough U.D.C.	2	2	0
Federation of British Cremation Authorities	2	2	0
Fell, Mr. N. F.	1	1	0
Fletcher, Mr. J.	1	1	0
Ford Motor Co. Ltd.	26	5	0
*Forrester, Dr. C.	2	2	0
Fox, Dr. R. H.	1	1	0
Franklin, Charles Ltd.	2	2	0
*Gandy, Mr. H.	1	10	0
*Gandy, Miss R. L.	2	2	0
Gas Council	350	0	0
Gillingham Corporation	10	10	0
*Gillison, Dr. J. A.	2	2	0
Gilpin, Mr. A.	1	1	0
Gosport Corporation	1	1	0
Graves, Mr. T. G.	1	1	0
Gravesend Corporation	8	8	0
Greater London Council	100	0	0
*Green, Mr. J.	1	1	0
Greenhead, Mr. S.	1	1	0
Greenwich, London Borough of	26	5	0
Greenwood, Mrs. E. L.	2	2	0
Groves, Mrs. G. I.	1	1	0
Guildford R.D.C.	10	10	0
Guinness, A. Son & Co. Ltd.	26	5	0
Hackney, London Borough of	37	16	0
Hales, Mr. J. S.	2	2	0
Halstead, Mr. V.	1	1	0
Hammersmith, London Borough of	26	5	0
Harlow U.D.C.	8	8	0
Harris Engineering Co. Ltd.	21	0	0
Harrold Leather Mfg. Co. Ltd.	1	1	0
Harrow, London Borough of	26	5	0
Hastings Corporation	10	10	0
Havant & Waterloo U.D.C.	8	8	0
Havering, London Borough of	37	16	0
Held, Mr. P. E. J.	1	1	0
Hemel Hempstead Corporation	8	8	0
Hickman, Miss V.	1	1	0
High Wycombe Corporation	8	8	0
Hillingdon, London Borough of	26	5	0
Hitchin U.D.C.	6	6	0
Hoddesden U.D.C.	6	6	0
Holiday Fellowship Ltd.	2	2	0
Horsham U.D.C.	6	6	0
Hounslow, London Borough of	26	5	0
Hove Corporation	10	10	0
Hulme, Mr. G. H.	1	5	0
Hussey, Mr. R.	1	1	0
Ibbetson, Mr. H.	10	10	0
Imperial Chemical Industries Ltd.	100	0	0
Institute of Fuel	26	5	0
Institution of Gas Engineers	15	15	0
International Combustion (Holdings) Ltd.	21	0	0
*Jackson, Mr. P. L.	2	0	0
*James, Mr. B. W.	1	0	0
Jellis, Mr. F.	1	1	0
Jones, Mr. D. P. G.	1	1	0
Joy Trading Corporation	15	15	0
Kendall, Dr. J. G.	1	1	0
Kenney, Mr. J. G.	1	1	0
Kensington & Chelsea, London Borough of	3	3	0
Kent County Council	5	5	0
*Kershaw, Mr. C. A.	1	1	0
Kingston upon Thames, London Borough of	26	5	0

	£	s.	d.
Kirkpatrick, Mr. D. A.	1	1	0
*Kitchen, Mr. C. H.	2	0	0
Lambeth, London Borough of	37	16	0
Langwell, Mr. W. H.	1	1	0
Laundon, Mr. J. R.	1	1	0
Lax, Mrs. G.	1	1	0
Leagrave Press Ltd.	15	15	0
Lee, Sir Kenneth	1	0	0
*Lee, Mr. S. A.	1	5	0
Leverson Gower, Mrs.	1	1	0
Lewin, Mr. J. U.	1	1	0
Lewisham, London Borough of	37	16	0
Littlehampton U.D.C.	1	11	6
London Corporation	50	8	0
London & Counties Coke Distributors' Association (2)	31	10	0
London Electricity Board	68	0	0
London & Home Counties Clean Air Advisory Council (2)	31	10	0
London Trades Council	2	2	0
London Transport Board	26	5	0
Lord, Mr. D. G.	1	1	0
Luton Corporation	2	2	0
*MacNair, Mr. A. S.	1	1	0
Mason, Mr. J. K.	1	1	0
Maidenhead Corporation	8	8	0
Mann, Mr. A. C.	1	1	0
*Matthews, Dr. N. E.	1	1	0
Medawar, Lady	1	0	0
Melland, Mr. B.	1	10	0
Mellins, Mrs. M. H.	1	1	0
Menuhin, Mr. Y.	1	1	0
Merton, London Borough of	26	5	0
Metal Box Co. Ltd.	15	15	0
Mobil Oil Co. Ltd.	26	5	0
Monkhouse, Dr. A. C.	1	1	0
Moreland, Mr. S.	1	1	0
Moriarty, Mr. T. M.	1	1	0
Municipal Passenger Transport Association (Inc.)	15	15	0
Nagle, Mr. B. R.	1	1	0
National Carbonising Co. Ltd.	26	5	0
National Coal Board	1,000	0	0
National Federation of Coke Distributors' Association (2)	52	10	0
New Forest R.D.C.	10	10	0
Newham, London Borough of (2)	10	10	0
Nightingale, Mr. M. J. H.	2	0	0
Nonhebel, Dr. G.	1	1	0
Northfleet U.D.C.	6	6	0
North Thames Gas Board	105	0	0
Oliver, Mr. G. T.	1	1	0
Oxford Corporation (2)	52	10	0
Pain, Mrs. N.	1	1	0
Parker, Dr. A.	5	5	0
Parkinson, Mr. A. C.	1	1	0
Parry, Mr. M.		15	0
Pavey, Mr. A. F.	1	5	0
Pedrick, Mr. F.	1	1	0
Pennington, Mr. W. J.	1	1	0
Petrofina (Gt. Britain) Ltd.	26	5	0
Platt, Mrs. K. M.	1	1	0
Poole, Mrs. W. M.	1	1	0
Portsmouth Corporation	10	10	0
Potter, Dr. N. M.	1	1	0
Preston, Dr. T. W.	1	1	0
Public Transport Association	21	0	0
Radiation Ltd.	31	10	0
Reading Corporation	5	5	0
Redbridge, London Borough of	26	5	0
Reigate Corporation	1	1	0
Richard, Mr. J. P.	1	1	0
*Richardson, Mr. R. L.	4	0	0
Rickett Cockrell Co. Ltd.	7	7	0
Rickmansworth U.D.C.	8	8	0
Road Haulage Association Ltd. (2)	31	10	0
Robbins, Mr. and Mrs. R. H. A.	1	1	0
*Robinson, Mrs. E.	2	2	0
Rochester Corporation	8	8	0
Rogers, Mr. E. C.	1	1	0
Rogers, Miss J. S.	1	0	0
Roper, Mr. J. D.	1	1	0
Roper, Captain R.		10	6
Rosling, Miss E. M.	1	1	0
Royal Society of Health	15	15	0
Rundle, Mr. L. G.		15	0
St. Albans Corporation	10	10	0
Sansum, Mrs. E. B.	1	1	0
Saunders, Mrs. J.	1	1	0
Scorer, Professor R. S.	1	1	0
Scotson, Mr. D. A.	1	1	0
Shackcloth, Mr. W.	1	1	0
Shanks, Mr. E. C.		15	0
Shaw Scott, Mr. G.	1	1	0
Shell International Petroleum Co. Ltd.	150	0	0
Shell-Mex & B.P. Ltd.	150	0	0
Slough Corporation	10	10	0
Smith, Mr. A. R.	2	2	0
Smith, Mrs. P.	1	1	0
Solid Smokeless Fuels Federation	52	10	0
Southampton Corporation	1	1	0
South Eastern Electricity Board	48	0	0
South Eastern Gas Board	105	0	0
Southend on Sea Corporation	2	2	0
Southern Electricity Board	67	0	0
Southern Gas Board	36	15	0
Southwark, London Borough of	37	16	0
Southwick U.D.C.	6	6	0
Sowby, Dr. F. D.	1	1	0
Spoor, Dr. N. L.	1	1	0
Staines U.D.C.	8	8	0
Stansfield, Mr. A. F.	1	1	0
Stewart, Mr. R. E.	2	2	0
Stoddard, Dr. A.	2	0	0
Stubbs, Mr. G. C.	1	1	0
Sturtevant Engineering Co. Ltd.	2	2	0
Sullivan, Mr. J. S.	1	1	0
Sutherland, Mr. J. W.	1	1	0
Sutton, London Borough of	26	5	0
Taylor, Mr. C. P. (2)	2	2	0
Thomas, Mr. R. F.	1	1	0
Thurrock U.D.C.	26	5	0
Tiranti, Mr. A.		10	0
Todd, Mr. G. F.	2	2	0
Toussaint, Dr. C. H. C.	1	1	0
Tower Hamlets, London Borough of	26	5	0
Trinity Development Ltd.	26	5	0
Trist, R. & Co. Ltd. (2)	63	0	0
Tunbridge Wells Corporation	1	1	0
Turner, Dr. W. C.	1	1	0
Vine, Mr. & Mrs. G. M.	2	2	0
Voeux, Mrs. M. F. Des	5	5	0
Waddell, Mr. A.		15	0
Watford Corporation	10	10	0
Watford R.D.C.	10	10	0
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Watson, Professor H. E.	2	0	0
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Westbrook, Mr. J.	1	1	0
Westminster Corporation	37	16	0
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White, Dr. H. D. J.	1	0	0
Wigan, Mr. N. H.	1	1	0
Willison, Mrs. M. E.	1	1	0
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Windsor U.D.C.	6	6	0
Women's Advisory Council on Solid Fuel	15	15	0
Women's Gas Federation	26	5	0
Woodall Duckham Ltd.	26	5	0
Worthing Corporation	2	2	0
Wycombe R.D.C.	8	8	0
Zink, J. & Co. Ltd.	15	15	0

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Abercwmboi Clean Air Committee	1	1	0
Aberdare U.D.C.	8	8	0
Abertillery U.D.C.	8	8	0
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Barry Corporation	8	8	0
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Bedwellty U.D.C.	8	8	0
Bridgend U.D.C.	6	6	0
Caerleon U.D.C.	6	6	0
Caerphilly U.D.C.	8	8	0
Cardiff Corporation	37	10	0
Cardiff R.D.C.	8	8	0
Clarke, Mr. J. A.	1	5	0
Coal Merchants Federation of Wales	5	5	0
Cwmbran U.D.C.	6	6	0
Ebbw Vale U.D.C.	10	10	0
Gallygaer U.D.C.	8	8	0
Glamorgan County Council	50	8	0
Harry, Mr. T. W.	1	1	0
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Llanelly R.D.C.	8	8	0
Llantrisant & Llantwit Fardre R.D.C.	8	8	0
Magor & St. Mellons R.D.C.	6	6	0
Merthyr Tydfil Corporation	10	10	0
Monmouthshire County Council	37	16	0
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Mynyddislwyn U.D.C.	6	6	0
Neath Corporation	8	8	0
Newport Corporation	26	5	0
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Pontypool U.D.C.	8	8	0
Pontypridd U.D.C.	8	8	0
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Swansea Corporation	26	5	0
Swansea Port Health Authority	15	15	0
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North East Region: Duke House, Duke Street, Newcastle-upon-Tyne, 1 (Newcastle-upon-Tyne (0632) 611181) (Telex: 53276) (Cables: Elliotauto Newcastle-upon-Tyne).
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Hull Office: 7 Pier Street, Hull (Central 35346).

Riley (IC) Products Ltd.
19 Woburn Place, London, W.C.1 (01-837 2622).

BURNERS, SOLID FUELS

Babcock & Wilcox (Operations) Ltd.
Babcock House, 209 Euston Road, London, N.W.1 (01-387 4321).
Rutland House, 148 Edmund Street, Birmingham, 3 (Central 6131).
Aylward House, Wine Street, Bristol, 1 (Bristol (C) 294561).
54 West Nile Street, Glasgow, C.1 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (Central 8326).
Stonebow House, The Stonebow, York (York 58645).

Riley (IC) Products Ltd.
19 Woburn Place, London, W.C.1 (01-837 2622).

CEILINGS, HEATED

Norris Warming Co. Ltd.
Burley House, 5-11 Theobalds Road, London, W.C.1 (01-405 7833).
2-3 Melrose Avenue, Clifton, 8, Bristol (Bristol 30261).
Norris House, 611 Stretford Road, Manchester, 15 (061-872 3454).
Cross House, Westgate Road, Newcastle (Newcastle 611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

CENTRAL HEATING SYSTEMS

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook, Bucks. (Colnbrook 2185).

A. H. Bibbey Ltd.
High Wych, Sawbridgeworth, Herts. (Bishop's Stortford 3407/8).
Industrial Estate, Raynham Road, Bishop's Stortford, Herts. (*Husqvarna, Gasvarna*).

John Ford Engineers (Plymouth) Ltd.
Hillcrest Works, Oakfield Terrace Road, Cattedown, Plymouth (Plymouth 63351/2).

Jones & Campbell Ltd.
P.O. Box 36, Torwood Foundry, Larbert, Stirlingshire, Scotland (Larbert 2114, 4 lines) (*"Torglow" and "Torglow" trend room heaters*).

Norris Warming Co. Ltd.
Burley House, 5-11 Theobalds Road, London, W.C.1 (01-405 7833).
2-3 Melrose Avenue, Clifton, 8, Bristol (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 15 (061-872 3454).
Cross House, Westgate Road, Newcastle (Newcastle 611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

Radiation Central Heating Ltd.
Radiation House, North Circular Road, Willesden, London, N.W.10 (01-459 1234) (*"Heatmaster", "Ductair"*).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

CENTRAL OIL DISTRIBUTION SYSTEMS

Borsari and Co.
CH 8702, Zollikon-Zurich, Switzerland (Zurich 658 655) (*fuel oil storage tanks for district heating*).

E. G. Reeve & Sons Ltd.
Burton Road, St. Faith's Industrial Estate, Norwich, Norfolk, NOR 84N (Norwich 47228) (*steel chimneys and tanks*).

CHIMNEYS

F. E. Beaumont Ltd.
Rathgar Road, London, S.W.9 (01-274 4066) (Telex: 25837).
Midlands Office: 28 Birmingham Street, Oldbury, Warley, Worcs. (021-552 2030) (Telex: 338146).
South West Office and Works: Woodlands Road, Mere, Warminster, Wilts. (Mere 481) (Telex: 41129) (*Beauval, Beauvent, Insulflo, Econoflu, Clements, Beauvent*).

Combustion Equipment Ltd.
Bloors Lane, Rainham, Gillingham, Kent (Medway 32234/6) (*"Cory" grit arrester, "Airlok" and "Interlok" dampers*).

E. G. Reeve & Sons Ltd.
Burton Road, St. Faith's Industrial Estate, Norwich, Norfolk, NOR 84N (Norwich 47228) (*steel chimneys and tanks*).

Steel Chimneys Ltd.
P.O. Box 1, New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

Thermotank Ltd.
Products Division, Chapelhall Industrial Estate, By Airdrie, Lanarkshire (Airdrie 4871).
60 Rochester Row, London, S.W.1 (01-828 5415) (*Dribore chimneys*).

Tipton Tub & Tube Co. Ltd.
Bloomfield Road, Tipton, Staffs. (021-557 1011 and 3418).

Wright & Summerhill Ltd.
Lupton Street, Leeds, 10 (Leeds 75434/5)

CHIMNEY CLADDING (ALUMINIUM)

F. E. Beaumont Ltd.
Rathgar Road, London, S.W.9 (01-274 4066) Telex: 25837).
Midlands Office: 28 Birmingham Street, Oldbury, Warley, Worcs. (021 552 2030) (Telex: 338146).
South West Office and Works: Woodlands Road, Mere, Warminster, Wilts. (Mere 481) (Telex: 41129) (*Beauval, Beauvent, Insulflo, Econoflu, Clements, Beauvent*).

Combustion Equipment Ltd.
Bloors Lane, Rainham, Gillingham, Kent (Medway 32234/6) (*"Cory" grit arrester, "Airlok" and "Interlok" dampers*).

Steel Chimneys Ltd.
P.O. Box 1, New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

CHIMNEYS (INSULATED)

Thermotank Ltd.
Products Division, Chapelhall Industrial Estate, By Airdrie, Lanarkshire (Airdrie 4871).
60 Rochester Row, London, S.W.1 (01-828 5415) (*Dribore chimneys*).

CLEAN ROOMS

Air Movement Ltd.
Dover Road, Northfleet, Kent (Gravesend 64844) (*clean rooms and air conditioning*).

John Bass Ltd.
Fleming Way, Crawley, Sussex (Crawley 28765) (*"Bassaire"*).

Birfield Filtration Ltd.
44 Bradford Street, Birmingham, 5 (021-643 7961) (*Farr air filters*).

Constant Air Systems Ltd.
Raebarn House, Northolt Road, Harrow, Middlesex (01-864 0288).
Wolverley House, Digbeth, Birmingham, 5 (021-643 5148).

Norris Warming Co. Ltd.
Burley House, 5-11 Theobalds Road, London, W.C.1 (01-405 7833).
2-3 Melrose Avenue, Clifton, 8, Bristol (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 15 (061-872 3454).
Cross House, Westgate Road, Newcastle (Newcastle 611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

W.H.S. (Pathfinder) Ltd.
Brockhampton Lane, Havant, Hants. (Havant 3661) (Cable address: Pathfinder, Portsmouth) (*"Pathfinder"*).

COAL HANDLING PLANT

Buell Ltd.
8-10 Minerva Road, North Acton, London, N.W.10 (01-965 1761) (*Buell-Van Tongeren dust collection and powder classification plants, Buell-Büttner industrial drying and cooling plants*).

COMBUSTION TESTING EQUIPMENT

Elliott Process Automation Ltd.
Head Office (Southern Region and Overseas): Abbey Road, Park Royal, London, N.W.10 (01-965 8811 (Telex: 23196) (Cables: Elliotauto London, N.W.10).
Midland Region: 54 College Road, Perry Barr, Birmingham, 22B (021-356 5863/9) (Telex: 33764) (Cables: Elliotauto Birmingham).
North East Region: Duke House, Duke Street, Newcastle-upon-Tyne, 1 (Newcastle-upon-Tyne (0632) 611181) (Telex: 53276) (Cables: Elliotauto Newcastle-upon-Tyne).
North West Region: Tudor House, Meadway, Bramhall, Stockport, Cheshire (061-439 5000) (Telex: 66358) (Cables: Elliotauto Bramhall).
Scotland: Norfolk House, Princes Square, East Kilbride, Glasgow, Lanarkshire (East Kilbride (03552) 25311/2/3, 28317/8) (Telex: 77708) (Cables: Elliotauto Glasgow).

Shandon Scientific Co. Ltd.
65 Pound Lane, London, N.W.10 (01-459 8671) (*"Bacharach" combustion testing equipment*).

CONTRACTORS, HEATING

Borsari and Co.
CH 8702, Zollikon-Zurich, Switzerland (Zurich 658 655) (*fuel oil storage tanks: reinforced concrete, ceramic tile lined*).

Norris Warming Co. Ltd.
Burley House, 5-11 Theobalds Road, London, W.C.1 (01-405 7833).
2-3 Melrose Avenue, Clifton, 8, Bristol (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 15 (061-872 3454).
Cross House, Westgate Road, Newcastle (Newcastle 611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

CONTRACTORS, HEATING, VENTILATING & AIR CONDITIONING

John Bass Ltd.
Fleming Way, Crawley, Sussex (Crawley 28765) (*"Bassaire"*).

Carrier Engineering Company Ltd.
Carrier House, Warwick Row, London, S.W.1 (01-834 6858).
Pneumafil Division, Wrigley Street, Oldham, Lancs. (Main 1524).

Constant Air Systems Ltd.
Raebarn House, Northolt Road, Harrow, Middlesex (01-864 0288).
Wolverley House, Digbeth, Birmingham, 5 (021-643 5148).

Fan Application & Engineering Ltd.
76 Rivington Street, London, E.C.2 (01-739 9329).

John Ford Engineers (Plymouth) Ltd.
Hillcrest Works, Oakfield Terrace Road, Cattedown, Plymouth (Plymouth 63351/2).

Alfred Grindrod & Co. Ltd.
122/134 Charles Street, Sheffield, 1 (Sheffield 27591).

Heat & Air Systems Ltd.
155 Clarence Street, Kingston-upon-Thames, Surrey (01-546 2446) (*heating, air conditioning and ventilating engineers*).

Hope's Heating & Engineering Ltd.
Smethwick, Warley, Worcs. (021-558 2191).
London Office: 928 High Road, Finchley, London, N.12 (01-445 0482).

Leeds Office: Westland Road, Leeds, 11 (Leeds 73251/6).
Cardiff Office: 31 The Parade, Cardiff, Cf2 2xZ (Cardiff 23581/2).
Hull Office: 7 Pier Street, Hull (Central 35346).

Morgan Air Treatments Ltd.
Darwin Street, Birmingham, 12 (021-772 2096) (*"Morganair"*).

CONTROLLED DRAUGHT REGULATORS

Metro-Flex Group of Companies
Metro-Flex Works, Earl Cottages, Earl Road, London, S.E.1 (01-237 4331) (*"Metro-Flex"*).

Serck Visco
Stafford Road, Croydon, CR9 4DT, Surrey (01-686 3861/9).

CONVECTORS

A. H. Bibbey Ltd.
High Wych, Sawbridgeworth, Herts. (Bishop's Stortford 3407/8).
Industrial Estate, Raynham Road, Bishop's Stortford, Herts. (*Husqvarna, Gasvarna*).

Charles Lathe & Co. Ltd.
Moat Foundry, Upper Church Lane, Tipton, Staffs. (021-557 1887) (*"Claco"*).

Robinson Willey Ltd.
Mill Lane, Old Swan, Liverpool, 13 (051-228 4757).
U.G.I. House, 3-4 Bentinck Street, London, W.C.I (01-486 4781) (*DRUgasar gas heating*).

Radiation Gas Fires Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

COOLERS

Buell Ltd.
8-10 Minerva Road, North Acton, London, N.W.10 (01-965 1761). (*Buell-Van Tongeren dust collection and powder classification plants, Buell-Büttner industrial drying and cooling plants*).

Serck Visco
Stafford Road, Croydon, CR9 4DT, Surrey (01-686 3861/9).

DAMPERS

Combustion Equipment Ltd.
Bloors Lane, Rainham, Gillingham, Kent (Medway 32234-6) (*"Cory" grit arrester, "Airlok" and "Interlok" dampers*).

Metro-Flex Group of Companies
Metro-Flex Works, Earl Cottages, Earl Road, London, S.E.1 (01-237 4331) (*"Metro-Flex"*).

DEHUMIDIFIERS

Heat & Air Systems Ltd.
155 Clarence Street, Kingston-upon-Thames, Surrey (01-546 2446) (*heating, air conditioning and ventilating engineers*).

Heather Filters Ltd.
7 Kendall Place, Baker Street, London, W.1 (01-486 1801) (*"Humexair"*).

DISCHARGE VALVES

Buell Ltd.
8-10 Minerva Road, North Acton, London, N.W.10 (01-965 1761) (*Buell-Van Tongeren dust collection and powder classification plants, Buell-Büttner industrial drying and cooling plants*).

Nailsea Engineering Co. Ltd.
Samlesbury Airfield, Blackburn, Lancs. (Mellor 666) (Telex: 63146) (*"Pnu-Jet" dust filters and collectors*).

Western Precipitation Division
Joy Trading Corporation, 7 Harley Street, London, W.1 (01-580 7711) (*electrostatic precipitators, mechanical collectors, wet scrubbers, dust valves*).

DUCTING

Berk Ltd.
Paramount House, 75 Uxbridge Road, London, W.5 (Ealing 9251).
Malton Works, Lanchester, Durham (Lanchester 425) (*sheet metal, ducting and dust collection equipment*).

Combustion Equipment Ltd.
Bloors Lane, Rainham, Gillingham, Kent (Medway 32234-6) (*"Cory" grit arrester, "Airlok" and "Interlok" dampers*).

John Ford Engineers (Plymouth) Ltd.
Hillcrest Works, Oakfield Terrace Road, Cattedown, Plymouth (Plymouth 63351/2)

Hainault Engineering Co. Ltd.
2-6 Fowler Road, Hainault, Ilford, Essex (01-500 1253).
21 Highmoor, Kirkhill, Morpeth, Northumberland (*"Hainault"*).

Henderson Safety Tank Co. Ltd.
Imperial Way, Croydon Airport, Croydon, CRO-4LY Surrey (01-688 7777) (*snap-lock and spot-welded ducting*).

Morgan Air Treatments Ltd.
Darwin Street, Birmingham, 12 (021-772 2096) (*"Morganair"*).

Radiation Central Heating Ltd.
Radiation House, North Circular Road, Willesden, London, N.W.10 (01-459 1234) (*"Heatmaster", "Ductair"*).

Tipton Tub & Tube Co. Ltd.
Bloomfield Road, Tipton, Staffs. (021-557 1011 and 3418).

Wright & Summerhill Ltd.
Lupton Street, Leeds, 10 (Leeds 75434/5).

DUCT LINING SOUND ABSORBENT WITH LOW FIRE PROPAGATION

Declon Foam Plastics Ltd.
Cranborne Estate, Cranborne Road, Potters Bar, Herts. (Potters Bar 57151) (*"Acousti-foam" duct lining*).

DUST CLASSIFICATION PLANT

Buell Ltd.
8-10 Minerva Road, North Acton, London, N.W.10 (01-965 1761) (*Buell-Van Tongeren dust collection and powder classification plants, Buell-Büttner industrial drying and cooling plants*).

DUST COLLECTION EQUIPMENT & PLANT

Ambuco Ltd.
38-40 Featherstone Street, London, E.C.1 (01-253 7573).
N. H. Macdonald
Mansion House Chambers, Close, Newcastle-upon-Tyne, 1.
Dron & Dickson Ltd.
31 Kelvin Grove Street, Glasgow, C.3 (*industrial dust recovery and fume clearing plant*).

Alldays & Onions Ltd.
P.O. Box 234, Great Western Works, Sydenham Road, Birmingham, 11 (021-772 2551/4).

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook, Bucks. (Colnbrook 2185).

August's Ltd.
Exmoor Street, Halifax, Yorkshire (Halifax 61245-9) (Telex: 51642) (*August-National hydro-filter*).

Berk Ltd.
Paramount House, 75 Uxbridge Road, London, W.5 (Ealing 9251).
Malton Works, Lanchester, Durham (Lanchester 425) (*sheet metal, ducting and dust collection equipment*).

Buell Ltd.
8-10 Minerva Road, North Acton, London, N.W.10 (01-965 1761) (*Buell-Van Tongeren dust collection and powder classification plants, Buell-Büttner industrial drying and cooling plants*).

B.V.C. Engineering Ltd.
Leatherhead, Surrey (Ashtead 6121).

Centri-Spray Ltd.
Green Dragon House, 64-70 High Street, Croydon, CR9 1LG Surrey (01-688 7431) (Telex: 261251).

Centri-Spray G.m.b.H.
Lloyd Haus, Neue Weyerstrasse, Köln, 5, W. Germany (23 59 28) (Telex: 8882415).

Centri-Spray S.A.R.L.
88 Avenue Victor Hugo, Paris 16 eme, France (704 3066) (Telex: 62150) (*air washing and dust and fume collection*).

Chemical Construction (G.B.) Ltd.
Regal House, Twickenham, Middx (01-892 4455) (*Pease Anthony scrubbers*).

Combustion Equipment Ltd.
Bloors Lane, Rainham, Gillingham, Kent (Medway 32234-6) (*"Cory" grit arrester, "Airlok" and "Interlok" dampers*).

Constant Air Systems Ltd.
Raebarn House, Northolt Road, Harrow, Middx (01-864 0288).
Wolverley House, Digbeth, Birmingham, 5 (021-643 5148).

Davidson & Co. Ltd.
Sirocco Engineering Works, Belfast, BT5 4AG, Northern Ireland (Belfast 57251).
85-87 Jermyn Street, London, S.W.1 (01-930 3541) (*"Sirocco"*).

Drummond Dust & Fume Extractors Ltd.
Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (01-527 4441).

Duscon Engineering Ltd.
P.O. Box 8, Berry Hill, Droitwich, Worcs. (Droitwich 3631 (4 lines)).
44 Queen Elizabeths Walk, Wallington, Surrey (Wallington 4154) (*Dusmat, Dusclone, Duspak, Duspray, Dumist*).

Dust Control Equipment Ltd.
Thurmaston, Leicester, LE4 8HP (Syston 3333) (*dust control equipment for industry*).

Fan Application & Engineering Ltd.
76 Rivington Street, London, E.C.2 (01-739 9329).

Fan Systems Ltd.
2 Brazil Street, Manchester, 1, Lancs. (061-CEN 7156) (*fan installations*).

Harris Engineering Co. Ltd.
York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8) (Telex: 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

Heat & Air Systems Ltd.
155 Clarence Street, Kingston-upon-Thames, Surrey (01-546 2446) (*heating, air conditioning and ventilating engineers*).

Kavag-Uop Air Correction Co. Ltd.
11-12 Pall Mall, London, S.W.1 (01-930 7911).
Somerset House, Georges Street, Halifax, Yorks. (Halifax 65109).

Lodge-Cottrell Ltd.
George Street Parade, Birmingham, 3 (021-CEN 3388) (*electrofilters*).

Mikropul Ltd.
40 Towerfield Road, Shoeburyness, Essex (Shoeburyness 2373-5) (*dust collection equipment*).

Morgan Air Treatments Ltd.
Darwin Street, Birmingham, 12 (021-772 2096) (*"Morganair"*).

Nailsea Engineering Co. Ltd.
Samlesbury Airfield, Blackburn, Lancs. (Mellor 666) (Telex: 63146) (*"Pnu-Jet" dust filters and collectors*).

Powell Duffryn Engineering Co. Ltd.
Light Products Division, Berkshire House, High Street, Maidenhead, Berks. (Maidenhead 30311) (*Sly, Dynaclone Carlyle*).

Serck Visco
Stafford Road, Croydon, CR9 4DT Surrey (01-686 3861/9).

Spencer & Halstead Ltd.
Ossett, Yorks. (Ossett 5121).
84 High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031).
Spenstead House, Ashley Road, Epsom (Epsom 27101) (*"Spenstead"*).

Tilghman Wheelabrator Ltd.
Broadheath, Altrincham, Cheshire (061-928 4242.

Western Precipitation Division
Joy Trading Corporation, 7 Harley Street, London, W.1 (01-580 7711) (*electrostatic precipitators, mechanical collectors, wet scrubbers, dust valves*).

DUST COLLECTION PLANT

Bigwood Joshua & Co. Ltd.
Wednesfield Road, Wolverhampton, Staffs. (Wolverhampton 24771) (*Bigwood dust control*).

Thermix Industries Ltd.
143 Maple Road, Surbiton, Surrey (01-546 7799) (*"Airmix"*).

DUST SAMPLING EQUIPMENT

Airflow Developments Ltd.
Lancaster Road, High Wycombe, Bucks. (0494 25252).

C. F. Casella & Co. Ltd.
Regent House, Britannia Walk, London, N.1. (01-253 8581) (*Casella, London*).

Fleming Instruments Ltd.
Caxton Way, Stevenage, Herts. (Stevenage 3101-5) (Telex: 82385) (*particle sizing and analysing*).

ELECTRIC HEATING EQUIPMENT

Isopad Ltd.
Barnet By-Pass, Borehamwood, Herts. (01-953 2817) (*electric surface heaters*).

ELECTRICAL PRECIPITATORS

Harris Engineering Co. Ltd.
York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8) (Telex: 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

Kavag-Uop Air Correction Co. Ltd.
11-12 Pall Mall, London, S.W.1 (01-930 7911).
Somerset House, Georges Street, Halifax, Yorks. (Halifax 65109).

Pionex Ltd.
Werneth House, Hyde, Cheshire (061-368 3969).

Serck Visco
Stafford Road, Croydon, CR9 4DT Surrey (01-686 3861/9).

Western Precipitation Division
Joy Trading Corporation, 7 Harley Street, London, W.1 (01-580 7711) (*electrostatic precipitators, mechanical collectors, wet scrubbers, dust valves*).

ENGINEERS—CONSULTANTS

Adams & Adams
4 Carlton Crescent, Southampton, Hants, SO1 2EY (0703 22602) (*heating, ventilatting and air conditioning*).

EXHIBITION & DISPLAY CONTRACTORS

Central Display Co. Ltd.
78 Kimber Road, Southfields, London, S.W.18 (01-874 8044/9) (*exhibition contractors, display producers and printers*).

FANS

Airflow Developments Ltd.
Lancaster Road, High Wycombe, Bucks. (0494 25252).

Alldays & Onions Ltd.
P.O. Box 234, Great Western Works, Sydenham Road, Birmingham, 11 (021-772 2551/4).

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook, Bucks. (Colnbrook 2185).

Davidson & Co. Ltd.
Sirocco Engineering Works, Belfast, BT5 4AG, Northern Ireland (Belfast 57251).
85-87 Jermyn Street, London, S.W.1 (01-930 3541) (*"Sirocco"*).

Edgar Allen Aerex Ltd.
P.O. Box 46, Imperial Steel Works, Sheffield, 9 (Sheffield 49054).
Robertson House, Leas Road, Guildford, Surrey (0483 76666).
Portland Buildings, Portland Road, Aldridge, Staffs. (0922 52173).
Barton Chambers, off St. Anns Square, Manchester (061-832 6477) (*standard and special axial and centrifugal fans*).

Fan Systems Ltd.
2 Brazil Street, Manchester, 1, Lancs. (061-CEN 7156) (*fan installations*).

Pionex Ltd.
Werneth House, Hyde, Cheshire (061-368 3969).

Spencer & Halstead Ltd.
Ossett, Yorks. (Ossett 5121).
84 High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031).
Spenstead House, Ashley Road, Epsom (Epsom 27101) (*"Spenstead"*).

FILTERS, AIR

Birfield Filtration Ltd.
44 Bradford Street, Birmingham, 5 (021-643 7961) (*Farr air filters*).

Delbag Airfilters Ltd.
15 Kensington High Street, London, W.8 (01 - WES 5651) (Cables: Delfilters London W.8).

Duscon Engineering Ltd.
P.O. Box 8, Berry Hill, Droitwich, Worcs. (Droitwich 3631 (4 lines)).
44 Queen Elizabeths Walk, Wallington, Surrey (Wallington 4154) (*Dusmat, Dusclone, Duspak, Duspray, Dumist*).

Harris Engineering Co. Ltd.
York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8) (Telex: 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

Heather Filters Ltd.
7 Kendall Place, Baker Street, London, W.1 (01-486 1801) (*"Multi-Brush"*).

Luwa (U.K.) Ltd.
36-41 High Street, South Norwood, London, S.E.25 (01-LIV 6515).
96 Chapel Road, Sale, Cheshire (PYRamid 1491).

Nailsea Engineering Co. Ltd.
Samlesbury Airfield, Blackburn, Lancs. (Mellor 666) (Telex: 63146) (*"Pnu-Jet" dust filters and collectors*).

Serck Visco
Stafford Road, Croydon, CR9 4DT Surrey (01-686 3861/9).

Spencer & Halstead Ltd.
Ossett, Yorks. (Ossett 5121).
84 High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031).
Spenstead House, Ashley Road, Epsom (Epsom 27101) (*"Spenstead"*).

Tilghman Wheelabrator Ltd.
Broadheath, Altrincham, Cheshire. (061-928 4242.

FILTERS, AIR MEDIA

Declon Foam Plastics Ltd.
Cranborne Estate, Cranborne Road, Potters Bar, Herts. (Potters Bar 57151) (*"Selmat" air filter media*).

FIRE LIGHTERS (ELECTRIC)

Best Products Ltd.
Ranelagh House, Felixstowe, Suffolk (Felixstowe 3154-6) (*"Matchless" firelighter*).

FLUE ASH & CLINKER CONVEYING PLANT

B.V.C. Engineering Ltd.
Leatherhead, Surrey (Ashtead 6121).

FLUE DUST EXTRACTION PLANT

Buell Ltd.
8-10 Minerva Road, North Acton, London, N.W.10 (01-965 1761) (*Buell-Van Tongeren dust collection and powder classification plants, Buell-Büttner industrial drying and cooling plants*).

B.V.C. Engineering Ltd.
Leatherhead, Surrey (Ashtead 6121).

Centri Spray Ltd.
Green Dragon House, 64-70 High Street, Croydon, CR9 1LG Surrey (01-688 7431) (Telex: 261251).

Centri-Spray G.m.b.H.
Lloyd Haus, Neue Weyerstrasse, Köln 5, W. Germany (23 59 28) (Telex: 8882415).

Centri-Spray S.A.R.L.
88 Avenue Victor Hugo, Paris 16 eme, France (704 3066) (Telex: 62150) (*air washing and dust and fume collection*).

Collectron (Sales) Ltd.
175 Leckhampton Road, Cheltenham, Gloucester (Cheltenham OCH2 56355).

Combustion Equipment Ltd.
Bloors Lane, Rainham, Gillingham, Kent (Medway 32234-6) (*"Cory" grit arrester, "Airlok" and "Interlok" Dampers*).

Western Precipitation Division
Joy Trading Corporation, 7 Harley Street, London, W.1 (01-580 7711) (*electrostatic precipitators, mechanical collectors, wet scrubbers, dust valves*).

FLUE GAS DUST SAMPLING EQUIPMENT (B.C.U.R.A. TYPE)

Airflow Developments Ltd.
Lancaster Road, High Wycombe, Bucks. (0494 25252).

FLUE GAS DUST MONITORING DEVICE (C.E.G.B. TYPE)

Airflow Developments Ltd.
Lancaster Road, High Wyncombe, Bucks. 0495 25252).

Photoelectronics (Arcall) Ltd.
92 Oldfield Road, Sutton, Surrey (01-644 4571) (*M.O.M.*).

FLUE GAS TREATMENT

D.C.P. Systems Ltd.
Centre Heights, 137 Finchley Road, London, N.W.3 (01-586 1121).

FLUE HEATERS, BALANCED

Robinson Willey Ltd.
Mill Lane, Old Swan, Liverpool, 13 (051-228 4757).
U.G.I. House, 3-4 Bentinck Street, London, W.C.1 (01-486 4781) (*DRUgasar gas heating*).

FUEL EFFICIENCY ADVISORY SERVICE

National Industrial Fuel Efficiency Service
71 Grosvenor Street, London, W.1 (01-493 9706).

FUEL—ELECTRICITY SUPPLY

The Electricity Council
(EDA Division), Trafalgar Buildings, 1 Charing Cross, London, S.W.1 (01-930 6757).

The Electricity Council
30 Millbank, London, S.W.1 (01-834 2333).

FUEL—GAS

The Gas Council
59 Bryanston Street, London, W.1 (01-723 7030).

Scottish Gas Board
Granton House, 340 West Granton Road, Edinburgh, 5 (031-552 6271).

Northern Gas Board
G.P.O. Box 1 G.B., Newcastle-upon-Tyne, 1 (Newcastle 663322).

North Western Gas Board
Welman House, Altrincham, Cheshire (Altrincham 6311).

North Eastern Gas Board
New York Road, Leeds, 2 (Leeds 36291).

East Midlands Gas Board
De Montfort Street, Leicester (Leicester 50022).

West Midlands Gas Board
Wharf Lane, Solihull, Warwickshire (Solihull 6888).

Wales Gas Board
Snelling House, Bute Terrace, Cardiff (Cardiff 33131).

Eastern Gas Board
Sun Building, Clarendon Road, Watford (Watford 28555).

North Thames Gas Board
30 Kensington Church Street, London, W.8 (Western 8141).

South Eastern Gas Board
Katherine Street, Croydon, Surrey (Croydon 4466).

Southern Gas Board
164 Above Bar, Southampton (Southampton 75544).

South Western Gas Board
9a Quiet Street, Bath (Bath 60411).

FUEL—GAS (L.P.G.)

Shell-Mex and B.P. Gases Ltd.
Shell-Mex House, Strand, London, W.C.2 (01 - 836 1234) (*"Bottogas" - Butane, "Propagas"-Propane*).

FUEL OIL (DOMESTIC & INDUSTRIAL OIL FUELS)

Shell-Mex and B.P. Ltd.
Shell-Mex House, Strand, London, W.C.2 (01-836 1234).

FUEL (SOLID SMOKELESS)

Coalite & Chemical Products Ltd.
P.O. Box 21, Chesterfield, Derbyshire (Bolsover 2281/6) (*Coalite and Coalite nuts*).

National Carbonising Co. Ltd.
Mansfield, Notts. (Mansfield 22357).
34 Smith Square, London, S.W.1 (01-222 7331).

Scottish Rexco Ltd.
Comrie, Fife, Scotland (Saline 345) (*"Rexco" smokeless coal*).

FUEL OIL STORAGE TANKS

E. G. Reeve & Sons Ltd.
Burton Road, St. Faith's Industrial Estate, Norwich, Norfolk, NOR 84N (Norwich 47228) (*steel chimneys and tanks*).

FUEL OIL STORAGE TANKS (REINFORCED CONCRETE)

Borsari & Co.
CH 8702, Zollikon-Zurich, Switzerland (Zurich 658 655) (*tile lined underground tanks of reinforced concrete*).

FUME REMOVAL EQUIPMENT

Ambuco Ltd.
38-40 Featherstone Street, London, E.C.1 (01-253 7573).
N. H. Macdonald
Mansion House Chambers, Close, Newcastle-upon-Tyne, 1.

Dron & Dickson Ltd.
31 Kelvin Grove Street, Glasgow, C.3 (*industrial dust recovery and fume cleaning plant*).

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook, Bucks. (Colnbrook 2185).

Buell Ltd.
8-10 Minerva Road, North Acton, London, N.W.10 (01-965 1761) (*Buell-Van Tongeren dust collection and powder classification plants. Buell-Büttner industrial drying and cooling plants*).

Centri-Spray Ltd.
Green Dragon House, 64-70 High Street, Croydon, CR9 1LG Surrey (01-688 7431) (Telex: 261251).

Centri-Spray G.m.b.H.
Lloyd Haus, Neue Weyerstrasse, Köln 5, W. Germany (23 59 28) (Telex: 8882415).

Centri-Spray S.A.R.L.
88 Avenue Victor Hugo, Paris 16 eme, France (704 3066) (Telex: 62150) (*air washing and dust and fume collection*).

Chemical Construction (G.B.) Ltd.
Regal House, Twickenham, Middx (01-892 4455) (*Pease Anthony scrubbers*).

Constant Air Systems Ltd.
Raebarn House, Northolt Road, Harrow, Middx (01-864 0288).
Wolverley House, Digbeth, Birmingham, 5 (021-643 5148).

Drummond Dust & Fume Extractors Ltd.
Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (01-527 4441).

Duscon Engineering Ltd.
P.O. Box 8, Berry Hill, Droitwich, Worcs. (Droitwich 3631 (4 lines)).
44 Queen Elizabeths Walk, Wallington, Surrey (Wallington 4154) (*Dusmat, Dusclone, Duspak, Duspray, Dumist*).

Fan Application & Engineering Ltd.
76 Rivington Street, London, E.C.2. (01-739 9329).

Fan Systems Ltd.
2 Brazil Street, Manchester, 1, Lancs. (061-CEN 7156) (*fan installations*).

Heat & Air Systems Ltd.
155 Clarence Street, Kingston-upon-Thames, Surrey (01-546 2446) (*heating, air conditioning and ventilating engineers*).

Kavag-Uop Air Correction Co. Ltd.
11-12 Pall Mall, London, S.W.1 (01-930 7911).
Somerset House, Georges Street, Halifax, Yorks. (Halifax 65109).

Morgan Air Treatments Ltd.
Darwin Street, Birmingham, 12 (021-772 2096) (*"Morganair"*).

Serck Visco
Stafford Road, Croydon, CR9 4DT Surrey (01-686 3861/9).

Spencer & Halstead Ltd.
Ossett Yorks. (Ossett 5121).
84 High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031).
Spenstead House, Ashley Road, Epsom (Epsom 27101) (*"Spenstead"*).

Wright & Summerhill Ltd.
Lupton Street, Leeds, 10 (Leeds 75434/5).

FURNACE PRESSURE CONTROLLERS

Metro-Flex Group of Companies
Metro-Flex Works, Earl Cottages, Earl Road, London, S.E.1 (01-237 4331) (*"Metro-Flex"*).

FURNACES, KILNS, OVENS, ETC.

R. M. Catterson-Smith Ltd.
Adams Bridge Works, South Way, Exhibition Grounds, Wembley, Middx (01-902 4291) (*electric furnaces*).

Duscon Engineering Ltd.
P.O. Box 8, Berry Hill, Droitwich, Worcs. (Droitwich 3631 (4 lines)).
44 Queen Elizabeths Walk, Wallington, Surrey (Wallington 4154) (*Dusmat, Dusclone, Duspak, Duspray, Dumist*).

GAS CLEANING PLANT

Lodge-Cottrell Ltd.
George Street Parade, Birmingham, 3 (021-236 3388) (*electrofilters*).

Pionex Ltd.
Werneth House, Hyde, Cheshire (061-368 3969).

Western Precipitation Division
Joy Trading Corporation, 7 Harley Street, London, W.1 (01-580 7711) (*electrostatic precipitators, mechanical collectors, wet scrubbers, dust valves*).

GAS FLOW CALCULATORS

Harris Engineering Co. Ltd.
York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8) (Telex: 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

GAS HEATING EQUIPMENT

A. H. Bibbey Ltd.
High Wych, Sawbridgeworth, Herts. (Bishop's Stortford 3407/8).
Industrial Estate, Raynham Road, Bishop's Stortford, Herts (*Husqvarna, Gasvarna*).

Harris Engineering Co. Ltd.
York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8) (Telex: 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

Heat & Air Systems Ltd.
155 Clarence Street, Kingston-upon-Thames, Surrey (01-546 2446) (*heating, air conditioning and ventilating engineers*).

Radiation Central Heating Ltd.
Radiation House, North Circular Road, Willesden, London, N.W.10 (01-459 1234) (*"Heatmaster", "Ductair"*).

Radiation Gas Fires Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

Robinson Willey Ltd.
Mill Lane, Old Swan, Liverpool, 13 (051-228 4757).
U.G.I. House, 3-4 Bentinck Street, London, W.C.1 (01-486 4781) (*DRUgasar gas heating*).

GAS HEATING EQUIPMENT (BUTANE/PROPANE)

Harris Engineering Co. Ltd.
York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8) (Telex: 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

Radiation Gas Fires Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

Robinson Willey Ltd.
Mill Lane, Old Swan, Liverpool, 13 (051-228 4757).
U.G.I. House, 3-4 Bentinck Street, London, W.C.1 (01-486 4781) (*DRUgasar gas heating*).

GAS SCRUBBERS & WASHERS

Ambuco Ltd.
38-40 Featherstone Street, London, E.C.1 (01-253 7573).

N. H. Macdonald
Mansion House Chambers, Close, Newcastle-upon-Tyne, 1.

Dron & Dickson Ltd.
31 Kelvin Grove Street, Glasgow, C.3 (*industrial dust recovery and fume clearing plant*).

Chemical Construction (G.B.) Ltd.
Regal House, Twickenham, Middx (01-892 4455) (*Pease Anthony scrubbers*).

Collectron (Sales) Ltd.
175 Leckhampton Road, Cheltenham, Gloucestershire (Cheltenham OCH2 56355).

Drummond Dust & Fume Extractors Ltd.
Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (01-527 4441).

Duscon Engineering Ltd.
P.O. Box 8, Berry Hill, Droitwich, Worcs. (Droitwich 3631 (4 lines)).
44 Queen Elizabeths Walk, Wallington, Surrey (Wallington 4154) (*Dusmat, Dusclone, Duspak, Duspray, Dumist*).

Industrial & Metallurgical Equipment Ltd.
Wettern House, Dingwall Road, Croydon, CR9 3HA Surrey (01-686 3641) (*"Elbair" and "Meduse" scrubbers*).

Kavag-Uop Air Correction Co. Ltd.
11-12 Pall Mall, London, S.W.1 (01-930 7911).
Somerset House, Georges Street, Halifax, Yorks. (Halifax 65109)

Lodge-Cottrell Ltd.
George Street Parade, Birmingham, 3 (021-CEN 3388) (*electrofilters*).

Western Precipitation Division
Joy Trading Corporation, 7 Harley Street, London, W.1 (01-580 7711) (*electrostatic precipitators, mechanical collectors, wet scrubbers, dust valves*).

GRILLES, LOUVRES, ETC.

A. H. Bibbey Ltd.
High Wych, Sawbridgeworth, Herts. (Bishop's Stortford 3407/8).
Industrial Estate, Raynham Road, Bishop's Stortford, Herts. (*Husqvarna, Gasvarna*).

GRIT ARRESTERS

Ambuco Ltd.
38-40 Featherstone Street, London, E.C.1 (01-253 7573).

N. H. Macdonald
Mansion House Chambers, Close, Newcastle-upon-Tyne, 1.

Dron & Dickson Ltd.
31 Kelvin Grove Street, Glasgow, C.3 (*industrial dust recovery and fume cleaning plant*).

Alldays & Onions Ltd.
P.O. Box 234, Great Western Works, Sydenham Road, Birmingham, 11 (021-772 2551/4).

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook, Bucks. (Colnbrook 2185).

Bigwood Joshua & Co. Ltd.
Wednesfield Road, Wolverhampton, Staffs. (Wolverhampton 24771) (*Bigwood dust control*).

Buell Ltd.
8-10 Minerva Road, North Acton, London, N.W.10 (01-965 1761) (*Buell-Van Tongeren dust collection and powder classification plants Buell-Büttner industrial drying and cooling plants*).

Combustion Equipment Ltd.
Bloors Lane, Rainham, Gillingham, Kent (Medway 32234-6) (*"Cory" grit arrester "Airlok" and "Interlok" dampers*).

Fan Application & Engineering Ltd.
76 Rivington Street, London, E.C.2 (01-739 9329).

Fan Systems Ltd.
2 Brazil Street, Manchester, 1, Lancs. (061-CEN 7156) (*fan installations*).

The Incinerator Co. Ltd.
14 Coopers Row, Tower Hill, London, E.C.3 (01-709 9931) (*incinerators for all industrial and municipal wastes*).

Pionex Ltd.
Werneth House, Hyde, Cheshire (061-368 3969).

Thermix Industries Ltd.
143 Maple Road, Surbiton, Surrey (01-546 7799) (*"Airmix"*).

Tipton Tub & Tube Co. Ltd.
Bloomfield Road, Tipton, Staffs. (021-557 1011 and 3418).

Western Precipitation Division
Joy Trading Corporation, 7 Harley Street, London, W.1 (01-580 7711) (*electrostatic precipitators mechanical collectors, wet scrubbers, dust valves*).

HEAT EXCHANGERS

W. H. Dean & Son Ltd.
Accrington Road, Burnley, Lancs. (Burnley 21711) (*"Maxol" water heaters*).

HEATERS, AIR

Auto Combustions (London) Ltd.
360-364 Wandsworth Road, London, S.W.8 (01-622 9121) (*Swirlamiser oil and gas burners, and ACL warm air heaters*).

A. H. Bibbey Ltd.
High Wych, Sawbridgeworth, Herts. (Bishop's Stortford 3407/8).
Industrial Estate, Raynham Road, Bishop's Stortford, Herts. (*Husqvarna, Gasvarna*).

Hainault Engineering Co. Ltd.
2-6 Fowler Road, Hainault, Ilford, Essex (01-500 1253).
21 Highmoor, Kirkhill, Morpeth, Northumberland (*Hainault*).

Harris Engineering Co. Ltd.
York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8) (Telex: 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

Kavag-Uop Air Correction Co. Ltd.
11-12 Pall Mall, London, S.W.1 (01-939 7911).
Somerset House, Georges Street, Halifax, Yorks. (Halifax 65109).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

Wanson Co. Ltd.
7 Elstree Way, Borehamwood, Herts. (01 - 953 7111) (Telex: 261169) (*"Thermobloc" oil- or gas-fired air heating 150,000-16,000,000 Btu/hr.*).

HEATERS, FAN

Harris Engineering Co. Ltd.
York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).

75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8) (Telex: 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

HEATERS, INFRA-RED

Harris Engineering Co. Ltd.
York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8) (Telex: 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

HEATERS, LIQUID PHASE

Wanson Co. Ltd.
7 Elstree Way, Borehamwood, Herts. (01 - 953 7111) (Telex: 261169) (*"Thermopac" oil- or gas-fired process heaters 280,000-4,000,000 Btu/hr.*).

HEATERS, WATER

A. H. Bibbey Ltd.
High Wych, Sawbridgeworth, Herts. (Bishop's Stortford 3407/8).
Industrial Estate, Raynham Road, Bishop's Stortford, Herts. (*Husqvarna, Gasvarna*).

W. H. Dean & Son Ltd.
Accrington Road, Burnley, Lancs. (Burnley 21711) (*"Maxol" water heaters*).

Charles Lathe & Co. Ltd.
Moat Foundry, Upper Church Lane, Tipton, Staffs. (021-557 1887) (*"Claco"*).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

HEATING EQUIPMENT, DOMESTIC

A. H. Bibbey Ltd.
High Wych, Sawbridgeworth, Herts. (Bishop's Stortford 3407/8).
Industrial Estate, Raynham Road, Bishop's Stortford, Herts. (*Husqvarna, Gasvarna*).

Charles Lathe & Co. Ltd.
Moat Foundry, Upper Church Lane, Tipton, Staffs. (021-557 1887) (*"Claco"*).

Radiation Central Heating Ltd.
Radiation House, North Circular Road, Willesden, London, N.W.10 (01-459 1234) (*"Heatmaster" "Ductair"*).

Radiation Gas Fires Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

Robinson Willey Ltd.
Mill Lane, Old Swan, Liverpool, 13 (051-228 4757).
U.G.I. House, 3-4 Bentinck Street, London, W.C.1 (01-486 4781) (*DRUgasar gas heating*).

HEATING EQUIPMENT, INDUSTRIAL

Borsari & Co.
CH 8702 Zollikon-Zurich, Switzerland (Zurich 658 655) (*fuel oil storage tanks*).

HEATING EQUIPMENT, INDUSTRIAL (PROCESS SPACE)

R. M. Catterson-Smith Ltd.
Adams Bridge Works, South Way, Exhibition Grounds, Wembley, Middx. (01-902 4291) (*electric furnaces*).

Heat & Air Systems Ltd.
155 Clarence Street, Kingston-upon-Thames, Surrey (01-546 2446) (*heating, air conditioning and ventilating engineers*).

Isopad Ltd.
Barnet By-Pass, Borehamwood, Herts. (01-953 2817) (*electric surface heaters*).

Luwa (U.K.) Ltd.
36-41 High Street, South Norwood, London, S.E.25 (01-LIV 6515).
96 Chapel Road, Sale, Cheshire (PYRamid 1491)

Spencer & Halstead Ltd.
Ossett, Yorks. (Ossett 5121).
84 High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031).
Spenstead House, Ashley Road, Epsom (Epsom 27101) (*"Spenstead"*).

HEATING EQUIPMENT, INDUSTRIAL (SPACE)

Harris Engineering Co. Ltd.
York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156).
75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8) (Telex: 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

HEATING SYSTEMS—OIL

A. H. Bibbey Ltd.
High Wych, Sawbridgeworth, Herts. (Bishop's Stortford 3407/8).
Industrial Estate, Raynham Road, Bishop's Stortford, Herts. (*Husqvarna, Gasvarna*).

John Ford Engineers (Plymouth) Ltd.
Hillcrest Works, Oakfield Terrace Road, Cattedown, Plymouth (Plymouth 63351/2).

Harris Engineering Co. Ltd.
York Works, Browning Street, London, S.E.17 (01-703 7841/6).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol, 8 (Bristol 30371).
141 Bath Street, Glasgow, C.2 (City 6156). 75 Piccadilly, Manchester, 1 (Central 3546/7).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8) (Telex: 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

Hoval Boilers (U.K.) Ltd.
Northway House, High Road, Whetstone, London, N.20 (01-445 0454-7) (*dual fired combination boilers, controls, pumps, automatic radiator valves*).

HEATING TAPES (ELECTRIC)

Isopad Ltd.
Barnet By-Pass, Borehamwood, Herts. (01-953 2817) (*electric surface heaters*).

HUMIDIFIERS

Heat & Air Systems Ltd.
155 Clarence Street, Kingston-upon-Thames, Surrey (01-546 2446) (*heating, air conditioning and ventilating engineers*).

Heather Filters Ltd.
7 Kendall Place, Baker Street, London, W.1 (01-486 1801) (*"Satomair"*).

Spencer & Halstead Ltd.
Ossett, Yorks. (Ossett 5121).
84 High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031).
Spenstead House, Ashley Road, Epsom (Epsom 27101) (*"Spenstead"*).

INCANDESCENT/WHITING WET ARRESTERS FOR CUPOLAS

Wellman Incandescent Furnace Co. Ltd.
Cornwall Road, Smethwick, Warley, Worcs. (021-558 2121).

INCINERATORS

Bering Ltd.
Doman Road, Camberley, Surrey (Camberley 4191 (10 lines)) (*"Kleenaire" incinerators*).

Combustion Equipment Ltd.
Bloors Lane, Rainham, Gillingham, Kent (Medway 32234-6) (*"Cory" grit arrester, "Airlok" and "Interlok" dampers*).

The Incinerator Co. Ltd.
14 Coopers Row, Tower Hill, London, E.C.3 (01-709 9931) (*incinerators for all industrial and municipal wastes*).

Kavag-Uop Air Correction Co. Ltd.
11-12 Pall Mall, London, S.W.1 (01-930 7911).
Somerset House, Georges Street, Halifax, Yorks. (Halifax 65109).

G. F. Rider (Process Plant) Ltd.
Leeds Place Works, Tollington Park, London, N.4 (01-272 0404) (*incinerators and incinerator boilers*).

Riley (IC) Products Ltd.
19 Woburn Place, London, W.C.1 (01-837 2622).

Universal Machinery & Services Ltd.
Viceroy Works, Millshaw, Ring Road, Beeston, Leeds, 11 (Leeds 73761) (*Universal incinerators*).

Victor Products (Wallsend) Ltd.
G.P.O. Box 10, Wallsend, Northumberland (Wallsend 628331).
50 Pall Mall, London, S.W.1 (01-930 7142).
Victoria Chambers, Dale Road, Matlock, Derbyshire (Matlock 2318) (*Victor incinerators*).

INDICATORS

The General Electric Co. Ltd.
Witton-Kramer Division, Witton, Birmingham, 6 (021-327 1941) (*photoelectric smoke-detection equipment*).

INSTRUMENTS, GAUGES, METERS, ETC.

Airflow Developments Ltd.
Lancaster Road, High Wycombe, Bucks. (0494 25252).

Elliott Process Automation Ltd.
Head Office (Southern Region and Overseas): Abbey Road, Park Royal, London, N.W.10 (01-965 8811) (Telex: 23196) (Cables: Elliotauto London, N.W.10).
Midland Region: 54 College Road, Perry Barr, Birmingham, 22B (021-356 5863/9) (Telex: 33764) (Cables: Elliotauto Birmingham).
North East Region: Duke House, Duke Street, Newcastle-upon-Tyne, 1 (Newcastle-upon-Tyne (0632) 611181 (Telex: 53276) (Cables: Elliotauto Newcastle-upon-Tyne).
North West Region: Tudor House, Meadway, Bramhall, Stockport, Cheshire (061-439 5000) (Telex: 66358) (Cables: Elliotauto Bramhall).
Scotland: Norfolk House, Princes Square, East Kilbride, Glasgow, Lanarkshire (East Kilbride (03552) 25311/2/3, 28317/8) (Telex: 77708) (Cables: Elliotauto Glasgow).

LECTURE, FILMSTRIPS & NOTES

National Society for Clean Air
Field House, Breams Buildings, London, E.C.4 (01-242 5038) (*clean air notes for teachers and lecturers, leaflets, posters*).

Diana Wyllie Ltd.
3 Park Road, Baker Street, London, N.W.1 (01-723 7333 and 01-723 3330) (*colour filmstrips and lecture notes on air pollution, chronic bronchitis, safety and oil heaters, etc.*).

OIL BURNERS, FULLY AUTOMATIC

Quiet May Oil Burner Ltd.
Lion House, 72/75 Red Lion Street, London, W.C.1 (01-242 8244/5/6) (*"Quiet May"*).

OIL STORAGE TANKS

Borsari and Co.
CH 8702, Zollikon-Zurich, Switzerland (Zurich 658 655) (*reinforced concrete, ceramic tile-lined*).

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Centri-Spray G.m.b.H.
Lloyd Haus, Neue Weyerstrasse, Köln 5, West Germany (23 59 28) (Telex: 888 2415).

Centri-Spray S.A.R.L.
88 Avenue Victor Hugo, Paris 16 eme, France (704 3066) (Telex: 62150) (*air washing and dust and fume collection*).

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Centri-Spray G.m.b.H.
Lloyd Haus, Neue Weyerstrasse, Köln 5, West Germany (23 59 28) (Telex: 888 2415).

Centri-Spray S.A.R.L.
88 Avenue Victor Hugo, Paris 16 eme, France (704 3066) (Telex: 62150) (*air washing and dust and fume collection*).

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Charles Austen Pumps Ltd.
Petersham Works, 100 Royston Road, Byfleet, Surrey (Byfleet 43224/5) (*"Dymax" small oil-free diaphragm pumps*).

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Carron, Falkirk, Scotland (OFA4 21331).

Combustion Equipment Ltd.
Bloors Lane, Rainham, Gillingham, Kent (Medway 32234/6) (*"Cory" grit arrester, "Airlok" and "Interlok" dampers*).

Richard Haighton Ltd.
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Harris Engineering Co. Ltd.
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Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
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North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8) (Telex: 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

Radiation Gas Fires Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

RADIATORS

Allied Ironfounders Ltd.
28 Brook Street, London, W.1 (01-499 8941).
Sales Office: Cadbury Road, Sunbury-on-Thames, Middlesex (Sunbury (SM8) 5577) (*Allied radiators*).

REFRIGERATION PLANT

John Bass Ltd.
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Sales Office: Cadbury Road, Sunbury-on-Thames, Middlesex (Sunbury (SM8) 5577) (*Heatwave and Gay Glow gas fires*).

Cannon Industries Ltd.
Deepfields, Bilston, Staffs. (Bilston 43161).
4 Old Park Lane, London, W.1 (01-493 4861).

Radiation Gas Fires Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

ROOM HEATERS—OIL

A. H. Bibbey Ltd.
High Wych, Sawbridgeworth, Herts. (Bishop's Stortford 3407/8).
Industrial Estate, Raynham Road, Bishop's Stortford, Herts. (*Husqvarna, Gasvarna*).

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Sales Office: Cadbury Road, Sunbury-on-Thames, Middlesex (Sunbury (SM8) 5577) (*Rayburn room heaters, open fires and underfloor air fires*).

Richard Haighton Ltd.
Canning Street, Burnley, Lancs. (Burnley 25731/4) (*"Lofire"*).

Jones & Campbell Ltd.
P.O. Box 36, Torwood Foundry, Larbert, Stirlingshire, Scotland (Larbert 2114, 4 lines) (*"Torglow" and "Torglow" trend room heaters*).

Charles Lathe & Co. Ltd.
Moat Foundry, Upper Church Lane, Tipton, Staffs. (021-557 1887) (*"Claco"*).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

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North West Region: Tudor House, Meadway, Bramhall, Stockport, Cheshire (061-439 5000 (Telex: 66358) (Cables: Elliotauto Bramhall).
Scotland: Norfolk House, Princes Square, East Kilbride, Glasgow, Lanarkshire (East Kilbride (03552) 25311/2/3, 28317/8) (Telex: 77708) (Cables: Elliotauto Glasgow).

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Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol, 8 (Bristol 30371).
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Wellington House, 103/105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
St. Pauls Chambers, St. Pauls Parade, Sheffield (Sheffield 78165).
North Farm Works, Tunbridge Wells, Kent (Tunbridge Wells 23401/8) (Telex: 95181).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

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The Programme

Monday, 21 October

2030 Informal Gathering.

Tuesday, 22 October

1030 *Opening Session*
Civic Welcome by the Mayor of Harrogate, Councillor Alan Mais.
Opening and Address by Sir David Pitblado, Permanent Secretary, Ministry of Power.
Presidential Address.

1430 *Session* 2 "Clean Air and Future Fuel Usage". Papers on:
(i) Electricity, by P. A. Lingard, Member, Electricity Council.
(ii) Gas, by A. Hetherington, Deputy Chairman, The Gas Council.
(iii) Oil, by T. R. Grieve, Vice-Chairman, Shell-Mex and B.P. Ltd.
(iv) Solid Fuel, by Lord Robens, Chairman, National Coal Board.

2030 Civic Reception.

Wednesday, 23 October

0930 Extraordinary General Meeting (Members and their representatives only).

1000 *Session* 3 Chimneys. Papers on:
Design, by Dr. A. Parker.
Height, by Professor R. S. Scorer.
The Aesthetic Factor, by P. D. Spawforth, Planning Officer (Redevelopment) City of Leeds.
The Scheduled Processes, by F. E. Ireland, Chief Alkali Inspector.

1430 *Session* 4 The Measurement of Pollution. Papers on:
The National Survey, by the Warren Spring Laboratory.
The Monitoring Work of the C.E.G.B., with special reference to techniques and instrumentation.
(i) The Measurement of Grit and Dust, by D. H. Lucas and W. L. Snowsill.
(ii) The Measurement of Sulphur Dioxide, by W. G. Cummings, E. G. Kingham and F. R. Barber.

Thursday, 24 October

1000 *Session* 5 Road Vehicles. Papers on:
The Warwick Street Investigation, by W. M. Lewis, City Analyst, Coventry, and J. Bullock, Chief Public Health Inspector, Warwick.
The Abatement of Pollution from Petrol Vehicles in Britain, by R.A.C. Fosberry, Motor Industries Research Association.
Progress with Electrical Vehicles, by Dr. M. Barak, Chloride Electrical Storage Co. Ltd.

Afternoon:
Technical Visits and S.S.F.F. Golf Tournament.

Evening:
Conference Dinner.

Friday, 25 October

1000 *Session* 6 Domestic Smoke Control.
Paper on "Practical Problems in Introducing Smoke Control" by J. Harris, Chief Public Health Inspector, County Borough of Doncaster.

1200 Close of Conference and Exhibition.

The conference registration fee will remain as before, at £5, but an innovation this year will cater for persons who wish to attend only one session, or the two sessions in one day. There will be for them a special "day registration" fee of 30s, not including the printed papers.

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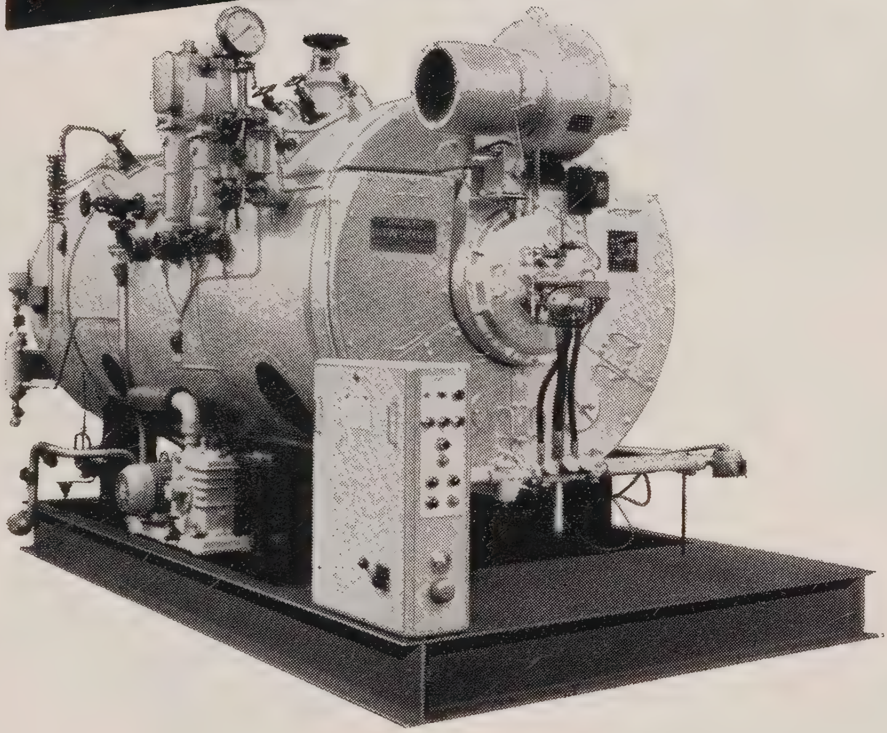

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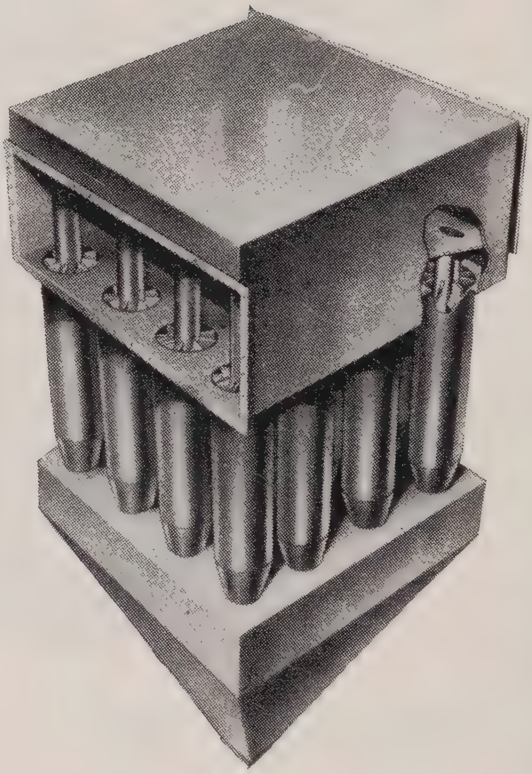

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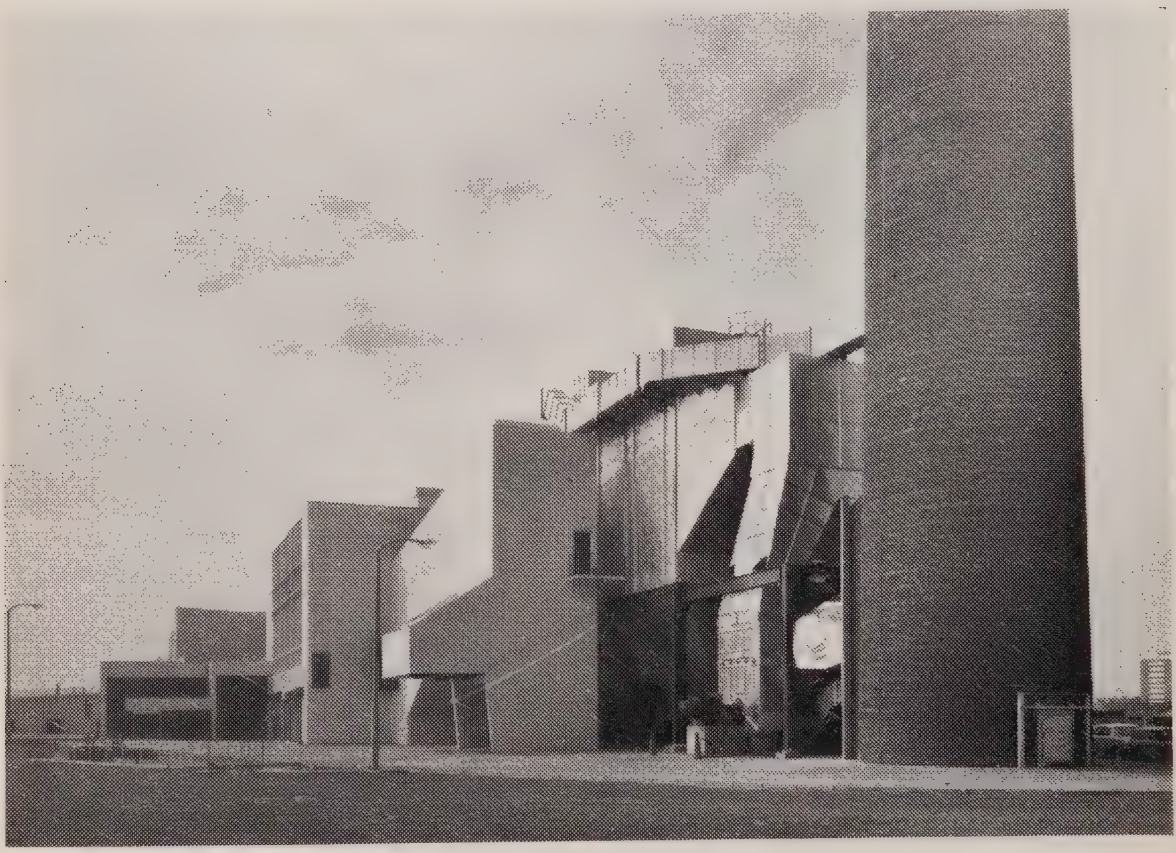

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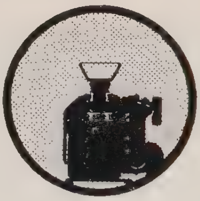

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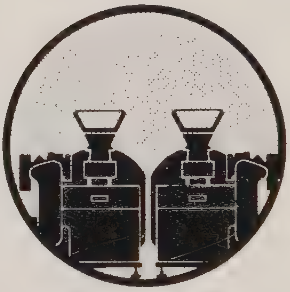

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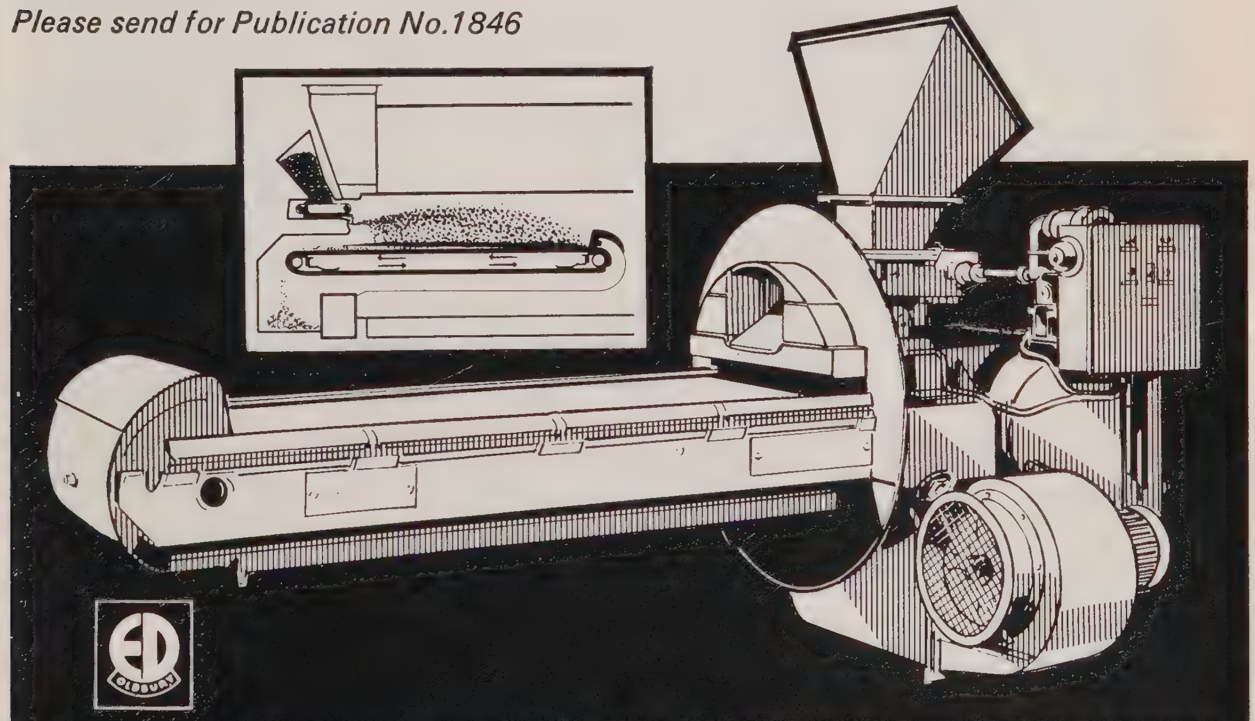

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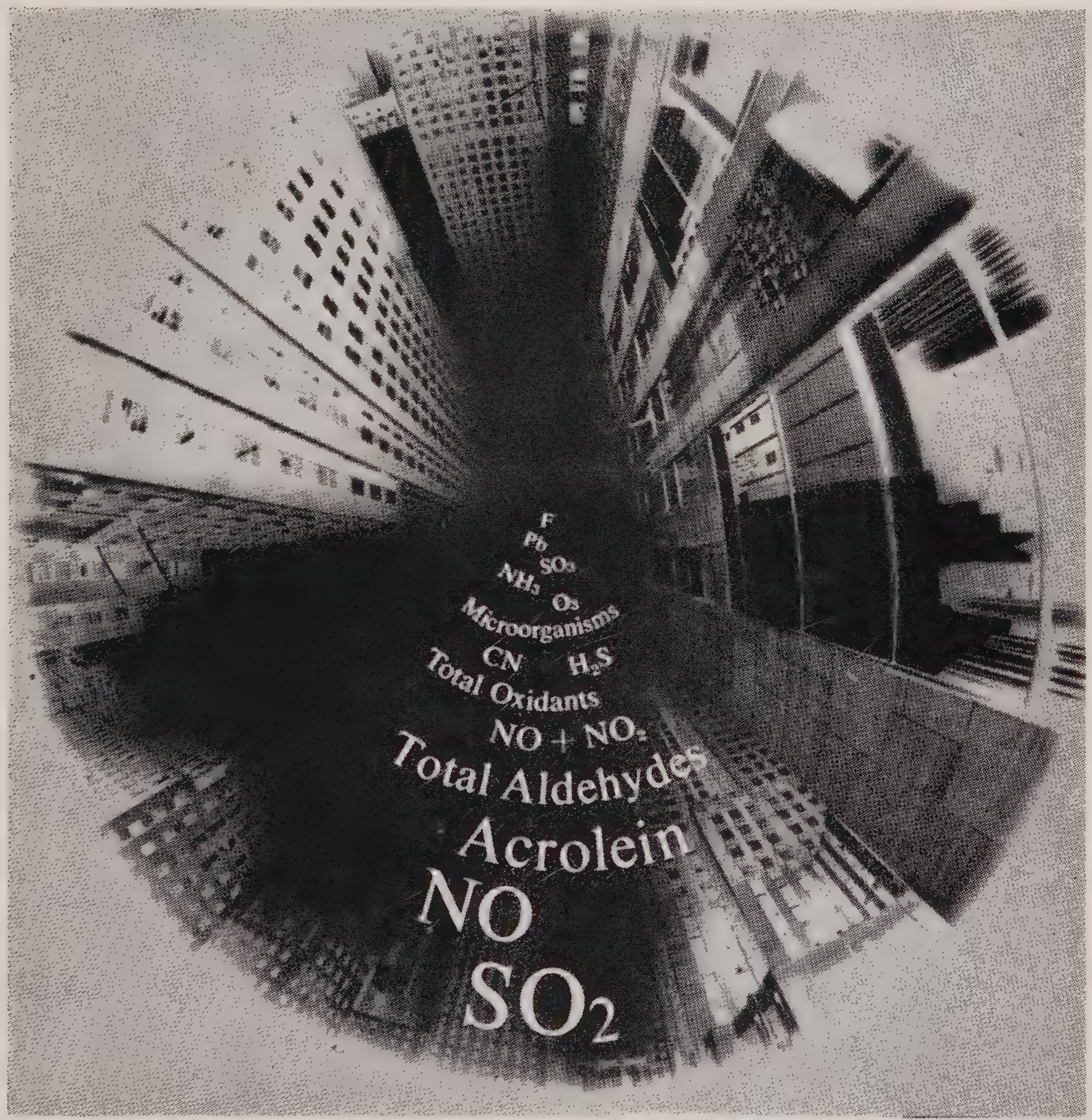

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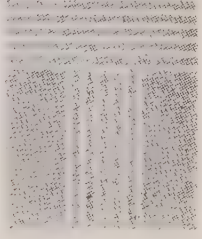

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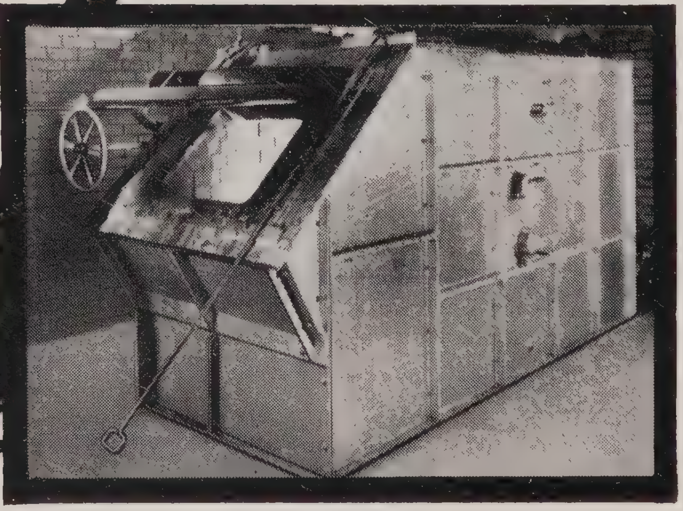

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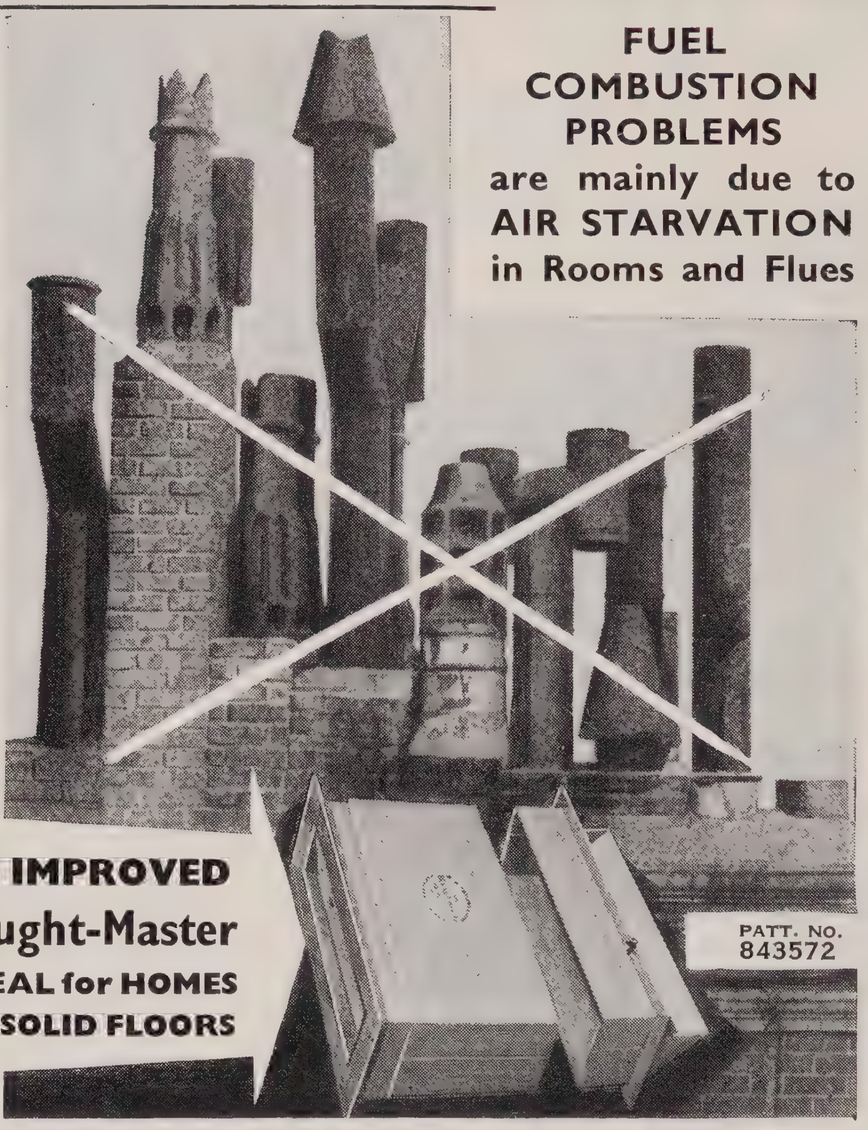

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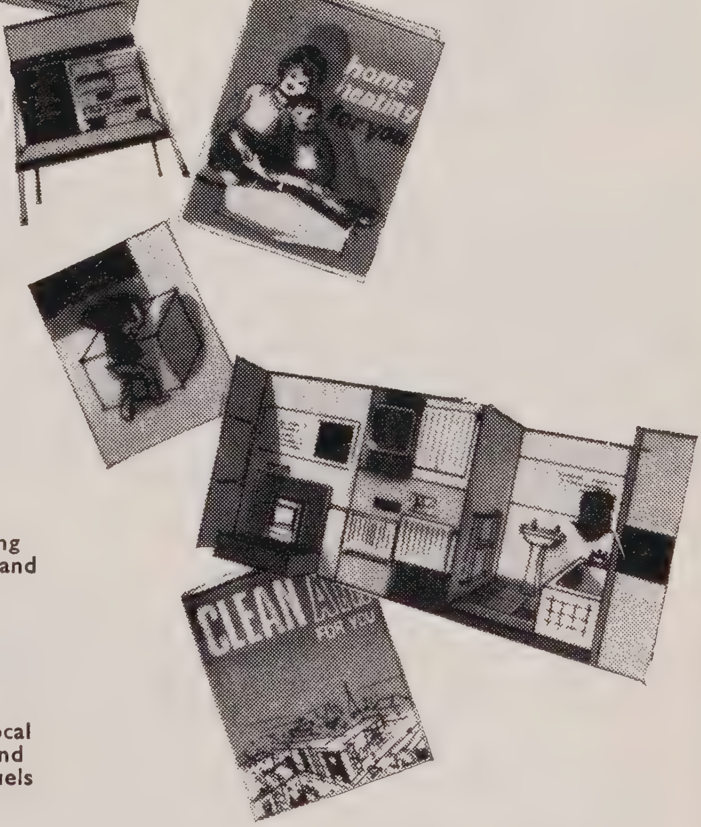

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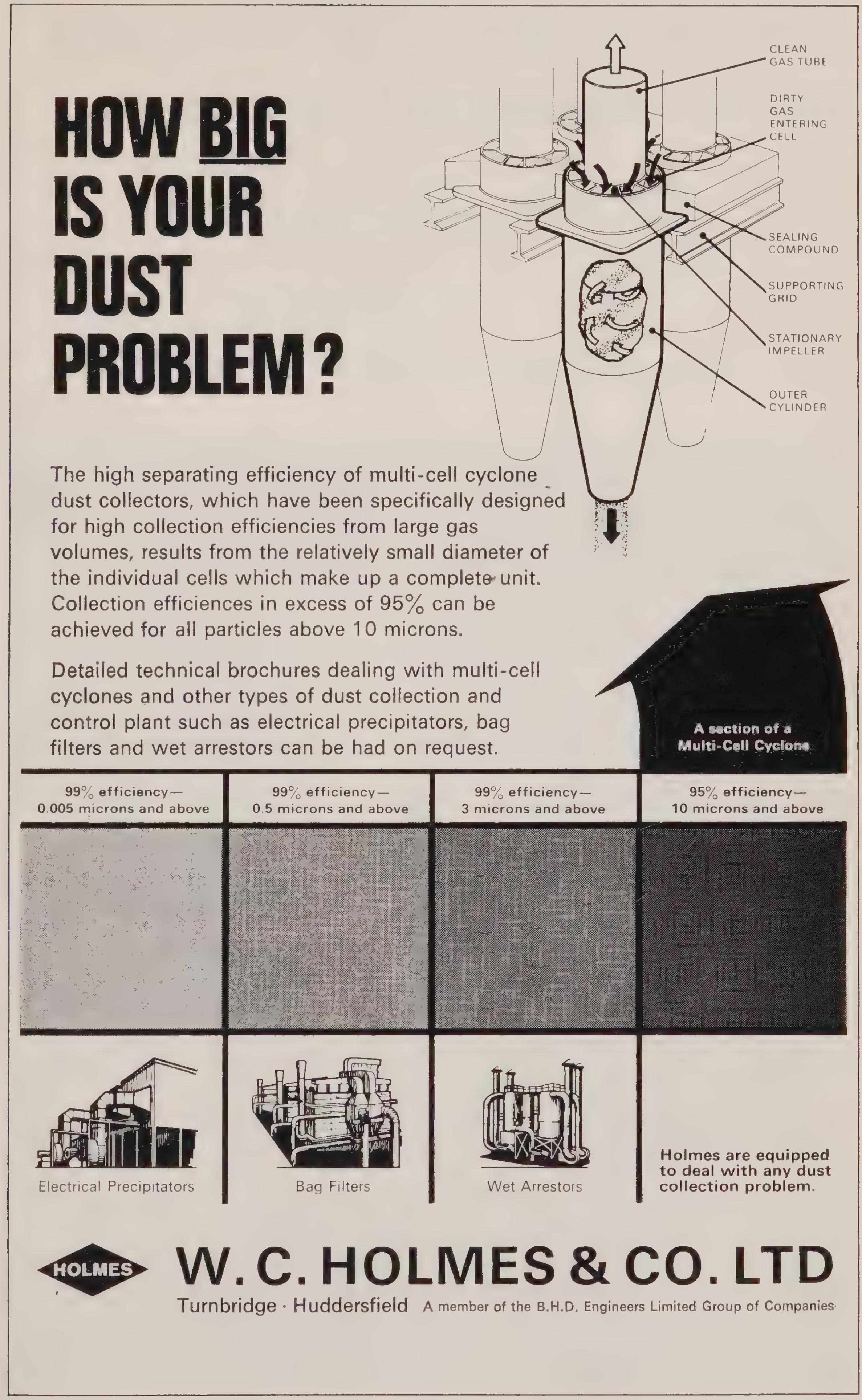

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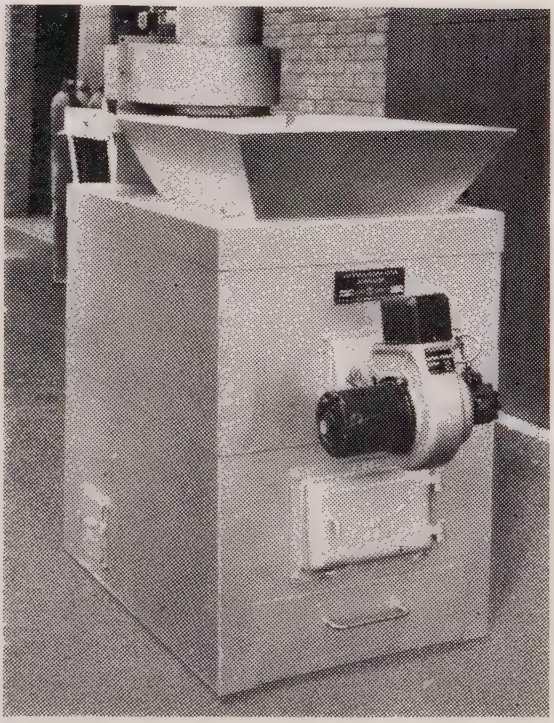

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1969–1970

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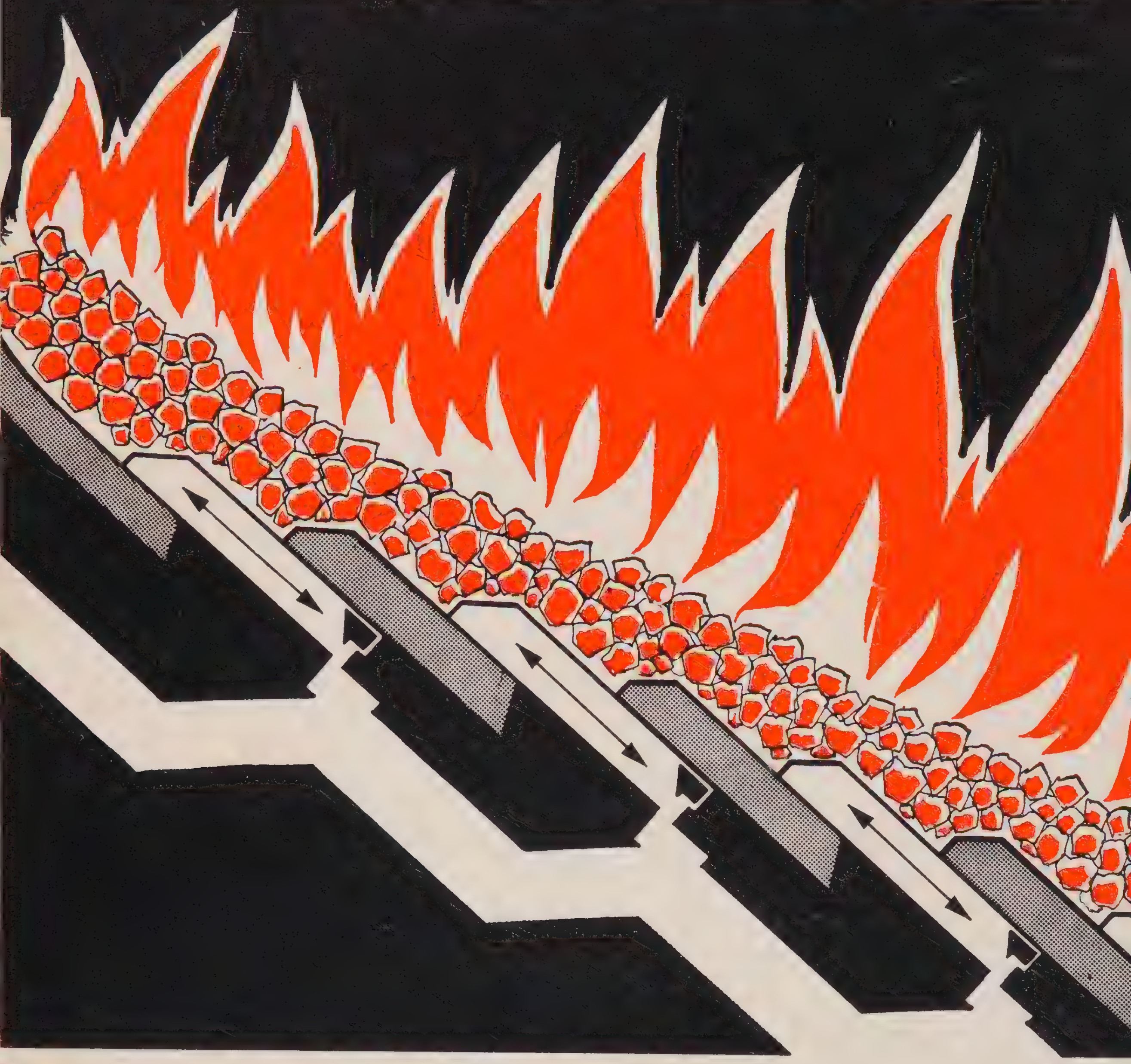

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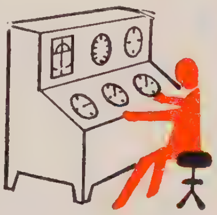

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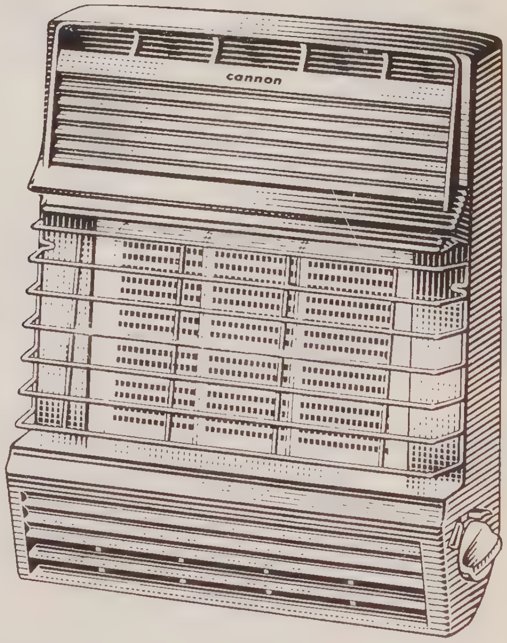

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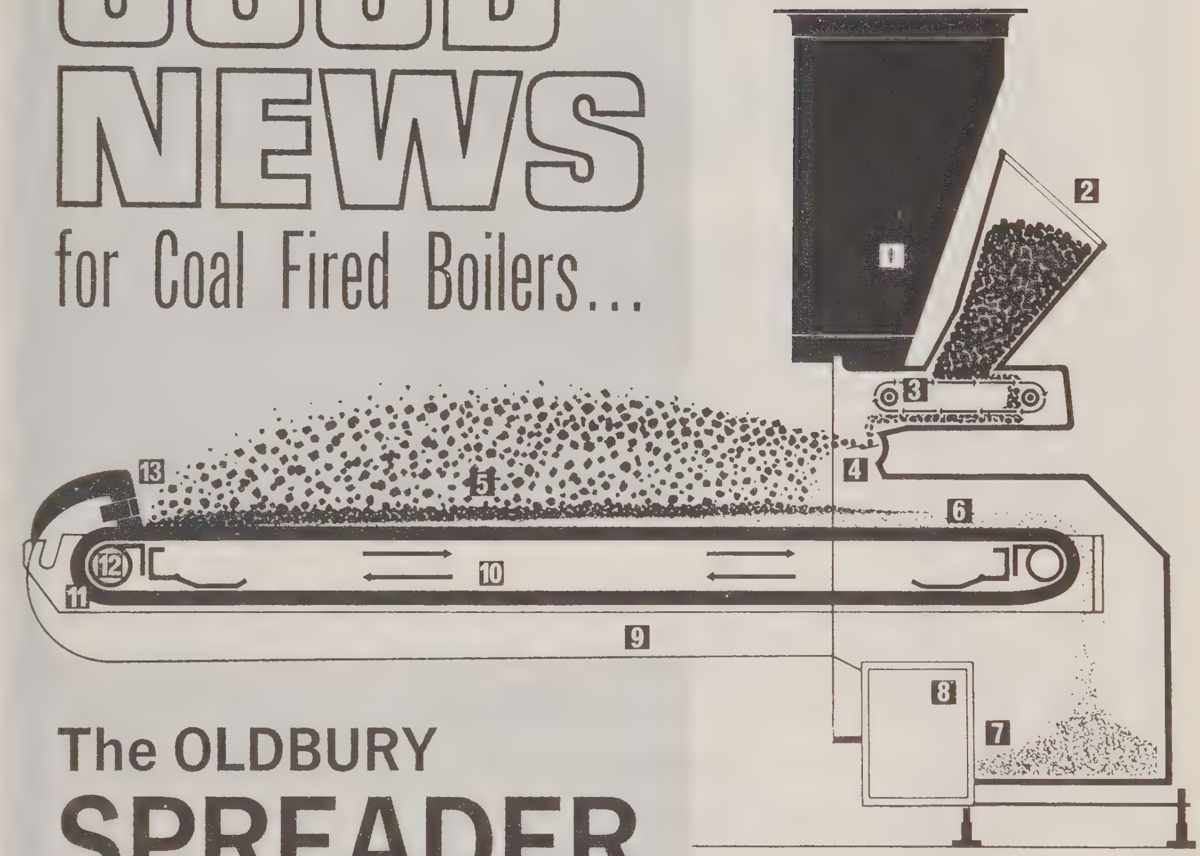

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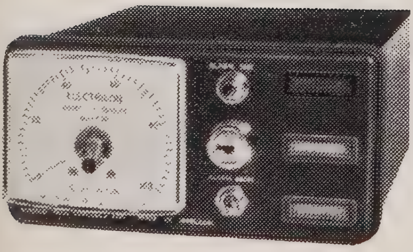

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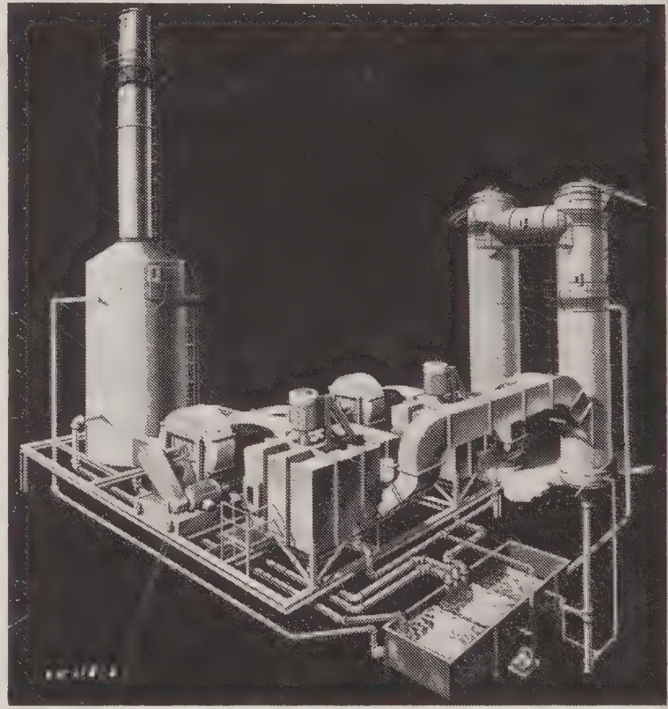

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CLEAN AIR YEAR BOOK 1969—1970

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Clean Air Progress

Review for 1968/1969

The most important event of the year, so far as clean air was concerned, has been the passing of Mr. Robert Maxwell's Clean Air Bill which received the Royal Assent on the 25 October, 1968, and certain clauses of which became law on 1 April, 1969. The remaining clauses will be brought into operation at dates yet to be announced. This new Act supplements, extends, and in some cases repeals the provisions of the 1956 Act. Those parts of the Act which are now in operation are included in the appropriate section of "The Law Relating to Air Pollution" later in this book.

Smoke Control

The number of new smoke control areas in the U.K. (in operation, confirmed and submitted) during the year ending 31 March, 1969 was 308, compared with 355 in the previous year. Although this figure compares favourably with the figures for earlier years, it indicates a big reduction in the advance of smoke control in the past twelve months. Although probably accounted for by financial stringency, it is nevertheless a retrograde step which can only be deplored. It is to be hoped that the current year will see the position restored, especially now that the Minister of Housing and Local Government has been given powers under Section 8 of the 1968 Clean Air Act to direct laggard local authorities to institute smoke control areas.

Greater London with over 74 per cent of premises covered by Smoke Control Orders still leads the field in smoke control progress.

District Heating

District heating is beginning to play an increasing part in the reduction of domestic smoke in addition to that already brought about by the increase in the number of smoke control areas and the continued advance of central heating. Although perhaps slow to start in this form of heating when compared with countries on the Continent, rapid progress is now being made in this country. The idea of selling heat—as opposed to fuel—is now catching on, and this is an important step forward in the cause of clean air.

Cleaner Cities

The photograph on the cover of this Year Book is a departure from those used in previous years in that it depicts one of the benefits of clean air. Trafalgar Square—and indeed much of London—has taken on a new look as the result of the cleaning of buildings. In the square mile of the City, some 250,000 plants a year, in several hundred varieties, now bloom where ten years ago only privet, holly, laurel and plane trees grew. The house martins and swifts have returned, and the amount of sunshine we enjoy has steadily increased. These benefits are not confined to London alone; similar things are happening in most of our big towns and cities—all brought about by cleaner air.

Overseas

On the international front, which is important to us all as air knows no frontiers, progress continues. This year there has been a meeting of the Executive Committee of the International Union of Air Pollution Prevention Associations to review progress and to prepare for the International Congress and Exhibition to be held in Washington D.C. in December 1970; and in February 1969 Government Officials of the countries of the Economic Commision for Europe met to establish a work programme on the prevention of air pollution.

CURRENT RESEARCH ON AIR POLLUTION

The following information is published by courtesy of the Interdepartmental Committee on Air Pollution Research and the Department of Education and Science.

Research on air pollution, financed directly or indirectly from public funds, is largely carried out by four organizations: (1) the Ministry of Technology's Warren Spring Laboratory, the main government laboratory responsible for air pollution research, other than medical research; (2) the Medical Research Council, responsible for research on medical effects of air pollution; (3) the Atomic Energy Research Establishment which entered the field of general air pollution research two years ago as a result of the policy of the diversification of A.E.R.E. effort, and whose programme in this field is planned in consultation with the Director of Warren Spring Laboratory, and (4) the industry which as the largest single consumer of fuel devotes much effort to pollution control, the Central Electricity Generating Board. Much research is also carried out by universities, colleges of technology and technical colleges.

The work of all these organizations is summarized in turn.

By Warren Spring Laboratory, Ministry of Technology

Warren Spring Laboratory's work on air pollution has two basic aims: first, to determine the seriousness and extent of pollution throughout the country and how it changes with time, and secondly, to find means of preventing or abating pollution near ground level, whether by direct reduction of emission, or by making use of the dispersal properties of the atmosphere.

Attainment of the first aim has been made possible by the National Survey of Air Pollution, which is supported by more intensive surveys over restricted areas, ranging in scale from town surveys down to surveys in streets or at various points of a single building. The second object involves ad hoc studies on methods of reducing emissions which seem a priority to have a chance of being economically feasible, studies of the dispersion of pollutants in the atmosphere in relation to such characteristics as chimney and building design and the structure of towns, and interpretation of survey data to give guidance to planners on how to design towns with minimum pollution.

Study of Extent of Pollution throughout the United Kingdom

(a) *The National Survey of Air Pollution*

The Laboratory is conducting a National Survey of pollution by smoke and sulphur dioxide involving daily measurements at over 1,200 sampling sites in some 450 urban and rural areas. This Survey was designed to assess the progress of Great Britain towards clean air, to discover where the need for remedial action was most urgent, to help the planning of new urban development on a sound basis so as to avoid air pollution as far as possible, and to provide information for studies of the effects of pollution on health. The scheme was designed on scientific lines so that the results obtained from it would be statistically valid. The co-operation of local authorities throughout the country in making the necessary daily measurements was sought, and the survey was based on simple equipment which can be used by relatively unskilled people, equipment which has since been accepted by the Organization for Economic Co-operation and Development (O.E.C.D.) for use throughout Europe wherever similar measurements are required. Collation and publication of all measurements made by local authorities and others, of grit and dust as well as smoke and sulphur dioxide, are the responsibility of Warren Spring Laboratory, which is also responsible for the interpretation of the data from the National Survey.

The Survey has now been in operation for a number of years; some preliminary analyses of the data accumulated have been made, sometimes in conjunction with the far less comprehensive but nevertheless valuable store of data already available before the survey began. The general picture of pollution by smoke and sulphur dioxide throughout Great Britain in the last ten or 15 years is therefore known. Efforts are now being concentrated, first, on providing a more detailed picture, on a regional basis, of the extent, variation and development of pollution, and secondly, on a systematic analysis and interpretation of the pollution and associated data with the help of a computer.

The Laboratory's National Survey team works in close co-operation with other bodies interested in the effects of air pollution, by providing data, lending instruments or acting in an advisory capacity, as appropriate. It also provides the secretariat for the Standing Conference of Co-operating Bodies (in respect of air pollution measurement) which meets twice a year, keeps local authorities and other bodies informed of the latest developments in the field, and provides a forum for discussion of problems and developments.

(b) *Town Surveys*

The Working Party which advised on the setting up of the National Survey also recommended "that Warren Spring Laboratory should arrange for an intensive survey to be made in one or two towns . . . as this would greatly facilitate the interpretation of the results of the new national survey".

(i) Sheffield

The Laboratory therefore placed a contract with the Department of Geography at Sheffield University, and collaborated with it in an intensive survey of air pollution in that city, on a geographical and meteorological basis. The objects were to study the distribution of pollution by smoke and sulphur dioxide over the Sheffield urban area to show distinctive features in relation to such factors as land utilization, industrial practice, surface relief and weather conditions; subsidiary projects included an investigation of drift of pollution from Sheffield and a study of sulphur dioxide emission by industry. The main part of this survey is now complete, though measurements are still being made to fill in details as to the relationships between pollution and weather. Some preliminary reports have been prepared including one on the relationship between daily average pollution and meteorological parameters such as air stability.

(ii) Edinburgh

Contracts have also been placed in past years with the Geography Department of Edinburgh University. The first was for a broad study of distribution of smoke and sulphur dioxide over the city in relation to land utilization, topography and climatological and meteorological variables; the second investigated smaller scale effects such as that of local topography on temperature and pollution; work under the present contract involves an emission survey (for which a method of computer mapping is being explored), a study of pollution and meteorological factors on Arthur's Seat (the distinctive volcanic mound on Edinburgh's eastern flank), and a study of temperature over the City.

(iii) London

There is no systematic air pollution survey of London, but sufficient measurements are made by local authorities and others in the Greater London area, at over 170 sites, to give a picture of the pattern of pollution by smoke and sulphur dioxide. The resulting data, supplemented by more intensive measurements by Warren Spring Laboratory in one or two places, permit analyses of variation of pollution with time and place, under normal conditions and during episodes of high pollution. An attempt is also being made to compile a sulphur dioxide emission map, for central London at least, and pollution is being measured at various heights on the Post Office Tower.

(c) *Micro-surveys*

Current small-scale surveys by the Laboratory include a survey on carbon monoxide in streets, undertaken at the request of the Ministry of Transport. Continuous measurements of carbon monoxide are being made, using infra-red analysers, on streets at city centres in Cardiff, Portsmouth, Manchester, Birmingham, Enfield and Glasgow. Results are given in the form of durations of concentrations above 10, 30 and 50 p.p.m.

Drift of pollution from towns into the country is being studied; a directional sampler has been developed especially for this purpose.

Prevention and Abatement of Pollution

(a) *Abatement of Emissions*

(i) Removal of Noxious or Unpleasant Compounds from Flue Gases.

Efforts have recently been concentrated on a study of emissions of oxides of sulphur and fluorine compounds from brickworks, including identification of the stages in the cycle at which the various pollutants are emitted, and attempts at identifications of the compounds and possible mechanisms responsible for the characteristic and obnoxious smell which extends for miles downwind of brickworks.

(ii) Pollution by Motor Vehicles

The Laboratory's work on pollution by motor vehicles is carried out in consultation with the Ministry of Transport and the motor industry and is directed at helping to provide the bases for legislative control of exhaust gases. Recent investigations have related to emission of smoke from diesel engines, and have included investigations of methods of roadside or laboratory testing of diesel engines for smokiness, and determination, using a panel of observers, of the level of smoke the public is prepared to tolerate. Attention is now being focussed on carbon monoxide emissions; determination of carbon monoxide concentration of exhaust gases during idling, as a routine check of engine efficiency, is being explored as part of a co-operative investigation by an Economic Commission for Europe committee.

(b) *Aerodynamic Problems affecting Dispersion of Pollution*

(i) Chimney Design in Relation to Buildings

High chimneys, including power station stacks, are usually tall enough for the flue gases not to be entrained in the turbulent wake of nearby buildings; experience has shown that if the chimney is at least 2½ times the height of neighbouring buildings there is no entrainment and little danger of the gases reaching the ground before they have been adequately diluted. Smaller installations, however, seldom have chimneys of such a height in relation to adjoining and surrounding buildings, and their plumes may under certain wind conditions create severe pollution problems. Dispersion of gases from such chimneys can be predicted from a study of a model in a wind tunnel but reliability of such tests is uncertain because of the impossibility of reproducing all the full-scale factors exactly in the wind tunnel. Experiments were therefore made by the Warren Spring Laboratory to compare the behaviour of plumes from a full-scale transportable experimental chimney of variable height with that of the plume from a model of the chimney and associated buildings in a wind tunnel; the final analysis of these experiments is nearing completion. At the time of the experiments, the Laboratory did not have its own wind tunnel; a wind tunnel is now being constructed at the Laboratory for further work of this kind.

(ii) Studies of dispersal of Pollution in the Upper Air

The Laboratory has now acquired lidar (light detection and ranging) equipment for exploration of the behaviour of pollution over town and country. The technique involves determination of the range and elevation of particulate matter which reflects back light emitted by a laser. It will be used to provide information on aspects such as inversion break-up, height to which pollution is mixed inside and outside cities, how mixing depth varies with time, with temperature structure (as determined by radiosondes or by means of a balloon), and with various weather factors, and how pollution is distributed within the pollution "dome" covering a city. Because of the possible, though unlikely, hazard to the sight of people in aircraft, radar is being used in conjunction with the laser range-finder to warn of the presence of planes.

Associated Activities

(a) *Methods of Measurement*

A considerable proportion of the Atmospheric Pollution Division's activity has to be devoted to the investigation and development of methods of measurement and instruments. Recent efforts have been directed at perfection of continuous sulphur dioxide recorders and directional pollution samplers, improvement of the accuracy of determination of very low, background concentrations of sulphur dioxide, development of a simple method of fluorine determination involving collection on a filter, and incorporation of data recording equipment in sulphur dioxide and other measuring equipment. Close co-operation is maintained, through the international organizations, with other countries, in order that methods may be improved and standardized.

(b) *Grit and Dust Sampling*

The Division's Scottish Branch has for some years had a programme of measurement of grit and dust emission from industrial chimneys, originally undertaken at the request of the Department of Health for Scotland (now carried out for the Scottish Development Department). The object is to have an indication of amount of emission from industrial plant, how it varies amongst works of the same type, how effective different types of cleaning equipment are and to what extent emission is being reduced from year to year. Techniques of sampling are based on the use of the B.C.U.R.A. cyclone probe.

(c) *International Co-operation*

The Division provides United Kingdom delegates for committees on air pollution of the Council of Europe, of the Organization for Economic Co-operation and Development, the European Federation of Chemical Engineers, and the Economic Commission for Europe. Current or recently completed co-operative research projects by such committees include work on problems of air pollution surveys in towns, compilation of a glossary, in four languages, of terms used in air pollution work, and work on problems of pollution by traffic.

By the Medical Research Council's Air Pollution Research Unit

The following notes describe briefly the current work on air pollution being done by the M.R.C. at St. Bartholomew's Hospital Medical College. For convenience the work is described in outline under various headings but it will be realized that the method of presentation does not mean that the topics are being investigated in isolation. The various investigations are highly integrated and it should be stressed that there is excellent liaison between the M.R.C. Air Pollution Unit, other M.R.C. units and other outside bodies.

Chemistry and Physics

As a prerequisite to the proper study of the effects of pollution much work is still being done on the chemical and physical nature of pollutants and methods for their determination.

(a) *Optical assessment of particulate pollution*

Optical methods are widely used to assess airborne particulate matter. In particular, smoke is commonly measured by the soiling of filters, but the techniques used are not the same everywhere and the measurements are interpreted on a purely empirical basis. It is therefore often difficult to compare results from different parts of the world, and even in this country to compare samples taken at the same place at different times, because the blackness of the particulate matter in the air is changing all the time as the Clean Air Act takes effect. The optics of the assessment of soiling, and the effect of the geometrical distribution of smoke particles collected on filters on the results obtained, have been studied, with a view to gaining a better understanding of the phenomena affecting the measurements. This understanding is a necessary preliminary to comparison of results obtained by different workers and to the development of methods better suited to present needs. Further work on the optics of particles deposited on glass slides is under way.

(b) *Studies on carcinogens*

Our interest in 3:4-benzpyrene and other polycyclic hydrocarbons is declining since not only are their concentrations in air now decreasing but the evidence that they are associated with lung cancer is much weaker than it was some years ago. Some studies on the stability of these hydrocarbons have shown that some of them appear to be destroyed by ultraviolet light and nitrogen dioxide. Investigation into the sources of polycyclics has shown that the relative proportion of certain hydrocarbons can vary; using a ratio of coronene to 1:2-benzpyrene (two stable hydrocarbons) it has been possible by analyzing samples of collected smoke to identify sources of hydrocarbons such as coal fires and motor vehicles. A study into the production of hydrocarbons from burning fuels has shown that the above hydrocarbon ratio increases markedly as the combustion efficiency increases.

(c) *Asbestos*

Asbestos can no longer be considered to be merely a pollutant of industrial atmospheres; recent work on the prevalence of mesotheliomas has shown the need to study it as an urban pollutant. Samples of asbestos which have been shown to be highly carcinogenic to rats have been examined for organic material. A number of constituents have been identified including trace amounts of 3:4-benzpyrene, and paraffinic hydrocarbons, a high proportion of which latter compounds come from the polythene bags with which the asbestos has been in contact, and a quinoid oxidation product of an anti-oxidant present in the polythene. The biological significance of contaminating substances associated with the asbestos has yet to be assessed.

Some preliminary studies on bulk samples of smoke collected in the City have been carried out in which the samples are extracted with organic solvents and ashed at low temperatures so that they can be examined with an electron microscope for asbestos fibres. A few asbestos-like fibres have been detected; examination using electron diffraction techniques is planned to help with the identification of such fibres.

(d) *Acid particles*

Acid particles, which may be of clinical significance, are very common in town air. Their source at times of low pollution appears to be the efficient combustion of fuels; past records show that at times of high pollution synthesis of acid takes place and that high concentrations of sulphur dioxide and smoke occurring together are important for the formation of much particulate acid.

Since sulphur trioxide vapour and sulphuric acid when inhaled are likely to have different physiological effects, some laboratory experiments are being carried out to determine how long the vapour can exist as such in air before it is converted to sulphuric acid.

(e) *Carbon monoxide*

Because of the many sources of carbon monoxide, its varying concentration in air, and the fact that its absorption depends on exercise and time, the measurement of carboxyhaemoglobin is greatly to be preferred to measurement of CO in air. The simpler indirect methods of measuring carboxyhaemoglobin such as the measurement of alveolar air are being tested; this involves simply analyzing carbon monoxide in exhaled air after breath-holding.

(f) *Electron microscopy*

Work is continuing on the depiction and identification of particulate pollutants by electron microscopy and electron diffraction, special attention being paid to asbestos. We have devised a method for treating samples of beer so that their residues can be examined for asbestos fibres using the electron microscope. This preparative technique could also be used for the study of asbestos fibres in samples of solid air pollutants.

(g) *Development of instruments and apparatus*

An oscillating glass slide for use with the cascade impactor and thermal precipitator is under development. It is designed to obtain larger dust sample traces for the work on the optics of particles deposited in glass slides.

Equipment is to be made for the generation of monodisperse aerosols which will include an automatic dual syringe drive.

Apparatus for the study of surface active materials is being developed.

The improvement and automation of lung function measurements is being studied with special reference to ways in which a digital computer may be used to accept and process signals from the whole body plethysmograph and other apparatus.

Physiology, Bacteriology and Histology

(a) *Physics of the lung and measurement of its function*

The fundamental study of the lung as a physical system is enabling us to reassess the methods of measuring its function in health and disease. Many techniques are currently used for assessing function but many of them have been developed empirically and do not measure any single mechanical property but rather some ill-defined combinations of properties. We hope that our current studies might simplify and place on a more rational basis the assessment of pulmonary function with special reference to the effects of air pollutants. The use of electronic methods and of digital and analogue computers are being studied.

(b) *Studies of acute effects of inhalation of pollutants*

Very many combinations of gases and aerosols of different composition have been inhaled in order to study their effects on airway resistance and gas diffusion. As yet no consistent responses have been seen to follow exposures to realistic concentrations in the laboratory.

Daily measurement of airway resistance following exercise has shown some correlation with pollution and this is being studied carefully.

Daily measurements of simple indices of pulmonary ventilation have been made for a five-year period on healthy volunteers but no consistent relation with pollution has been found. Measurements of peak expiratory flow rate on selected bronchitic patients continue and there is an indication that sensitivity to high peaks of pollution decreases as the winter goes on.

We are making long term cohort studies of lung function and respiratory symptoms on medical students to see if early signs of the development of chronic bronchitis is related to pollution, smoking habits, changes in residence, age and athleticism.

(c) *Carbon monoxide*

Following the development of the micro-method for determining CO in blood (mentioned above) surveys of blood levels have been made in people exposed occupationally or experimentally to traffic. These have shown, so far, that levels above four per cent saturation with carboxyhaemoglobin are rarely attained in non-smokers but levels higher than this (not uncommonly greater than ten per cent) are frequent in smokers. These surveys are being extended.

Experimental work is being done on the possible effects of carbon monoxide, producing a saturation of ten per cent, on the performance of fine tasks and on vigilance. So far the results have shown no perceptible effects of such saturations on flicker and flutter fusion thresholds. Work on more complex tests is being done.

(d) *Effect of irritant atmospheres in the chemical industry on bronchial mucosa*

We have arranged that samples of lung and bronchi from post mortem and biopsy material be sent to us for histological examination to assess the degree of mucosal hypertrophy. The material comes from I.C.I. employees and is examined "blind" in that their occupational exposure to irritants is not known. The work is designed to test the hypothesis that chronic bronchitis is not mainly caused by exposure to such simple chemical irritants as SO_2.

(e) *Bacteriology. Effects of pollutants on lung flora*

It has been suggested that pollution in town air is responsible for the greater prevalence of chronic bronchitis in towns compared with country districts. As part of our investigations into the possible relationship between air pollution and bronchitis we have been studying the effects (in vitro) of particulate pollutants collected from London air on the growth of some organisms found in the respiratory tract—Strep. viridans and Staph. aureus—and those commonly recovered from the sputum of patients with chronic bronchitis—Strep. pneumoniae and H. influenzae. Our experiments have shown that solid pollutants can not only inhibit bacterial growth on blood agar plates but they can also cause growth stimulation of H. influenzae. A chemical separation of pollutants has shown that the growth inhibitor is mainly in the water soluble fraction and the stimulator is in the organic soluble fraction. Studies so far suggest that the factors present in pollutants are not capable of replacing "X" or "V" as growth requirements but probably act indirectly through an effect on the medium.

Epidemiology

Our efforts to determine whether the marked improvement in pollution conditions in London during recent years have led to any corresponding improvements in health are continuing. There is now little evidence of any association between daily death rates, hospital admissions and pollution. This is due largely to the absence of periods of high pollution in recent years; we would not expect smoke to reach high values any more but there is good reason to believe that high concentrations of sulphur dioxide would still occur in temperature inversions. It may be however that the absence of a blanket of smoke and the increased turbulence introduced by tall buildings has reduced the risk of temperature inversions persisting through the daytime hours. Our latest "diary" study, in which patients who had responded consistently to changes in pollution in an earlier winter were again asked to record changes in their condition on a daily basis, has also failed to demonstrate any marked effects of pollution.

These results are encouraging, but we could not claim yet that the acute effects of pollution in London have been eliminated. We may merely have been lucky with the weather in recent winters, and the examination of daily death rates and hospital admission data will continue.

Studies on chronic effects also show encouraging signs; bronchitis mortality is beginning to decline again, particularly in London, and although the improvement may be due partly to changes in smoking habits and to improved therapy the situation is being watched carefully in relation to changes in pollution.

Studies of the epidemiology of lung cancer continues and, as evidence accumulates and is analysed, it is becoming increasingly apparent that cigarette smoking is of overwhelming importance as the main cause of the disease and the role of air pollution would appear to be minimal.

In all these studies use of computer techniques is being exploited where possible.

By The Atomic Energy Research Establishment

Objectives

The Harwell programme is concerned with studies of the physics and chemistry of pollutant gases and aerosols and the effects of these in the environment. Particular attention is being paid to the problem of industrial mists but the programme also includes an investigation into the uptake of SO_2 by building materials and by vegetation. The original Requirement of the Minister of Technology envisaged a need to develop new instruments for measuring pollutants especially sulphur dioxide. Subsequent investigation has not substantiated the need for development of a new sulphur dioxide instrument but an automatic nephelometer for visibility studies and a moving tape sampler for particular collection on an hourly basis have been developed primarily for the Tees-side Survey below.

Tees-side Survey

The object is to find out if there is more fog and mist on Tees-side than can be ascribed to geographical and meteorological factors alone and, if so, whether the cause is associated with any particular atmospheric pollutant.

During the summer of 1967, five stations were set up on Tees-side at which 24-hour samples of aerosols were collected on filter papers. The samples were analyzed chemically for some 20 constituents* considered to be the most likely stabilizers of mist droplets. The most common soluble ions, accounting on average for 65 per cent of the soluble species analyzed, were ammonium and sulphate which occurred in individual samples in a ratio close to that for ammonium sulphate. Using the visibility data from Tees-side airport, good correlation coefficients have been obtained between the reciprocal of visual range and the concentrations of ammonium and sulphate ion (correlation coefficients 0·85 and 0·94 respectively) despite the limitations inherent in 24-hour sampling. The correlation of visibility with sodium ion concentration was poor and with smoke, only moderate. Although by no means conclusive, the results indicate that ammonium sulphate plays a significant part in the visibility problem on Tees-side.

Comparison of the results from Tees-side with similar measurements at Harwell and others reported for places in Germany and U.S.A. reveal no gross overall excess of ammonium sulphate. However, so called "Tees-side mist" occurs on a limited number of days in the year and on one such day, 12 July, 1967, ammonium and sulphate ion concentrations of 33$\mu g/m^3$ and 130 $\mu g/m^3$ respectively were observed, much higher than has been reported elsewhere. There seems little doubt that the loss of visibility on that day was largely due to ammonium sulphate.

A paper on the 1967 results has been prepared for publication in the open literature with the approval of the Ministry of Housing and Local Government, I.C.I., the Chief Public Health Inspector of the County Borough of Middlesbrough and the former Chairman of the Committee, Dr. Hall.

During 1968 a comparison between three stations on Tees-side and others at Chester-le-Street, Leconfield, Speke, Kew and Harwell was undertaken results of which are still being analysed. In addition to the filter samples, gaseous ammonia and sulphur dioxide samples were taken also on a daily basis, to investigate the possibility that the ammonium sulphate is produced in the atmosphere by reaction between these two gases. Laboratory studies of this reaction both with and without particulate catalysts are also being undertaken.

Electron Microscope Investigations

Chemical analysis of filter paper or bubbler samples tells us what contaminants are in the air, but does not reveal how they are organized in particles. A technique is being developed for doing this with the electron microscope. It has already proved possible to characterize several types of particles found in the atmosphere (sodium chloride, carbon, ammonium sulphate) partly by their appearance and partly by their behaviour under the electron beam. This is an expensive and time consuming type of analysis which could not be applied routinely, but it may supply essential information on the origin of particular constituents of pollution.

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*Particulate acid (as H_2SO_4), SO_4, NO_3, NO_2, Cl, Br, Si, NH_4, Na, K, Ca, Mg, Al, Fe, Mn, V, Ti, Cr, Cu.

Preliminary results of a study of the ammonium component of the atmosphere at A.E.R.E. (June-September, 1968) show that particulate and gaseous concentrations are comparable and, in the rather abnormal meteorological conditions of 1968, have rarely been recorded outside the range 1 to 15 $\mu gm/m^3$ NH_4. Recognizable ammonium sulphate particles have been present to varying degrees in all the samples examined so far. The size range extends from less than 0·1 micron to 1·0 micron diameter.

Study of Visibility

The loss of visibility in fog and mist is mainly due to the scattering of light by the particles and droplets in the air. It is desirable to know what contaminants in the air are effective in reducing visibility. Standard methods of estimating visibility by observation of the maximum visible range are unsatisfactory for correlation with measurements of pollution because they can only be used at stations where there is full-time meteorological cover and also because the normal visual range depends on the scattering of light over a long path. An automatic instrument has been designed to measure the light-scattering property of the air over a short range. A prototype is being tested at Harwell and an industrial firm has shown interest in making the instrument commercially. Another instrument, also working on optical scattering, is being developed to measure droplet size distributions in mists and fogs.

Alongside the experimental work, a theoretical study has been made of the reductions in visibility to be expected from ammonium sulphate aerosols of different sizes and a paper has been submitted for publication. The calculations show that the visibility losses on Tees-side are quite consistent with the observed concentrations of ammonium sulphate.

Experiments with Radioactive SO_2

All the SO_2 which is released to the atmosphere must eventually be redeposited in some form. Otherwise there would be a long-term increase in SO_2 levels in the atmosphere. The uptake of SO_2 on surfaces can advantageously be investigated using a radioactive marker (^{35}S). In this way it is possible to observe the uptake over short periods of time without using unrealistic concentrations of SO_2. Work has been started on three aspects:

(*a*) Uptake of SO_2 by building materials, especially limestone.
(*b*) Uptake on interior surfaces, such as plastic and furnishings.
(*c*) Uptake by plants.

In addition to studying the fate of SO_2 in the atmosphere, it is hoped to learn more about the probable mechanism of damage by SO_2. The techniques of paper chromatography are being used to find what chemical compounds are formed with radioactive SO_2 after absorption by plant leaves. It may then be possible to discover the level of SO_2 in the atmosphere at which normal plant metabolism begins to break down.

Associated Projects

(a) *Uptake of Lead Aerosols in the Lung and Subsequent Metabolism*

The main object of this work is to estimate the dose to the lung from the inhalation of the daughter products of radon and thoron. The daughter products include two isotopes of lead, namely 214Pb or RaB, radioactive half life 26·8m, and ^{212}Pb or ThB, radioactive half life 10·6 h. In the present work, ThB is used, and is prepared in one of two forms, namely (a) adsorbed on Aitken nuclei in air (particles of about 0·1 μm diameter) and (b) as a vapour. Subjects have inhaled ThB in both forms and the activity retained in the lung, and subsequently transferred to blood, and the activity excreted in urine and faeces, have been measured.

The results, which have been prepared for publication, show that there is substantial uptake from the lung over a period of a few hours after inhalation. With ^{212}Pb adsorbed on Aitken nuclei, only a few per cent of the retained dose is excreted in the first three days after inhalation, but with ^{212}Pb as vapour there is substantial excretion in faeces. This is probably because the vapour is adsorbed in the upper respiratory tract, is brought up by ciliary action and is then swallowed.

(b) *Experimental Studies of the Biological Properties of Asbestos*

The connection between exposure to asbestos and the development of mesothelial tumours was first noted in 1960. Since then, the incidence of this disease has increased quite rapidly and there has been a corresponding upsurge in research into the biological properties of asbestos. A small programme was started at Harwell three years ago, in collaboration with the MRC Pneumoconiosis Research Unit, to see how radioactivity induced in asbestos by neutron activation could be used to study its structure and behaviour in biological systems. Work carried out to date has given information on the translocation of asbestos injected interpleurally and subcutaneously into rats and on the lung clearance of intratracheally injected fibres. It has been shown that chrysotile dissolves much more rapidly that the amphiboles in vivo. Some of this work was described at the International Conference on the Biological Effects of Asbestos held at Dresden in 1968.

In addition, the five asbestos reference samples distributed by the International Union Against Cancer (U.I.C.C.) have been analysed for a number of trace elements by neutron activation and their homogeneity investigated at the 10 mg. level which is the amount normally administered in animal experiments.

By the Central Electricity Generating Board

The main sources of air pollution from the operations of the Generating Board are the products of combustion of coal and oil. These are considered under the headings of: separation of solids from gases; disposal of solids; dispersion of gases. Brief reference is then made to other sources of air pollution.

Separation of Solids from Gases

Both the older and more modern pulverized fuel plants rely on electrostatic precipitation as the final or only stage of separation of particulate matter from flue gases. In the case of older plants whose grit arresting arrangements were inadequate by modern standards, a programme of conversion of some such plants to distillate oil firing and the re-equipment of others with improved or enlarged precipitators has been nearly completed. This has still left certain arrestor plants which ought to be, but are not consistently, operating with the desired degree of efficiency. A research programme, now nearing its close, has revealed unexpected deficiences in gas distribution, in rapping and in power supplies. As soon as this research can be applied to individual plants, the deficiencies are being made good. Poor gas distribution leads to reduced efficiency because the greater efficiency of dust removal in a starved channel does not fully compensate for the reduced efficiency in an overloaded one; when, by means of velocity measurements and model techniques, the gas flow has been analysed, baffles can be designed and inserted to smooth the flow. Rapping impulses by means of which the collected dust is removed from the precipitator electrodes, have been found by actual measurement with accelerometers to be much attenuated if transferred from one member, such as a holding frame, to another, such as the plate or wire itself. Research on optimum electrical subdivision of the precipitator has shown the need for maintaining maximum power supply to each section and the importance of correct electrode spacing to reduce flashover.

However, the biggest problem, when it occurs, arises from the fine grinding (for complete combustion) of low-sulphur coals. It appears that there is sometimes not enough SO_3 (H_2SO_4) available to confer sufficient surface conductivity on the precipitated dust layers. Partial corona suppression and back-ionization result, with consequent loss of efficiency. Present research is actively concerned with acceptable ways and means of restoring a normal degree of conductivity.

Ash Disposal

Local air pollution can arise where dust which is handled or dumped is allowed to dry. Econimical techniques of surface treatment are under investigation. There is a particular problem with cenospheres (floaters) on ash lagoons. These can dry on the surface layer and be picked up by the wind. A harvesting machine for skimming them off is now under trial.

Dispersion of Gases

Eight-day SO_2 samplers are used routinely around power station sites for a number of years before and after commissioning of the stations. In addition a number of stations have been intensively instrumented using in each case about two dozen continuously recording SO_2 instruments and full meteorological instrumentation. The SO_2 recorders were developed about ten years ago at C.E.R.L. and have been successfully used in these surveys. The surveys have given excellent support to theoretical predictions and to the effectiveness of tall chimneys in controlling large scale emissions of flue gas, as well as providing new knowledge on the particular influence of inversion layers above and below the chimney top. One important aspect of chimney height is now seen to lie in the proportion of inversions which are penetrated by the flue gases.

The ground level measurements have confirmed that the highest concentrations of SO_2 from tall power station chimneys occur in strong winds, when the background from low-level city pollution is low; conversely, under stable atmospheric conditions which cause poor dilution of city flue gases, power station gases can scarcely be detected at ground level and thus make virtually no contribution to pollution levels.

It is planned to conclude the Tilbury and West Burton investigations in 1969. A further survey of this type is under way at Eggborough which is the first 2,000 MW power station employing a single chimney. This survey will have 25 SO_2 recorders and meteorological measurements which for the first time give details of atmospheric conditions up to 1,250 feet from the surface of the earth. The use of a laser to measure the height of a plume, even though it is invisible to the eye, has been developed for some years at the Tilbury survey. This will continue to be used at Eggborough and its use will also be developed to study the temperature profile of the atmosphere in the range immediately above 1,250 feet.

Meantime, the possibility of re-planting old city sites with gas turbines for peak load raises the question of optimum chimney height. The gases are fairly hot, and very dilute in sulphur. The primary question that arises apart from the objections by city planners to high chimneys, is that of entrainment of downwash caused by the disturbance to air flow by other buildings. Research both in wind tunnels and full scale is being done on this.

Other Potential Problems

Increase of ground level relative humidity downwind of cooling towers has been looked for, with negative results. When the atmospheric relative humidity is high a long plume is formed, and it has been reluctantly concluded that nothing can be done about this so long as wet towers are used.

Persistent plumes, partly due to H_2SO_4 droplets, have been observed from the chimneys of some oil-fired stations, but close control of combustion has been found to minimize this.

By Universities and Colleges in the United Kingdom

Blackburn College of Technology and Design
Department of Pure and Applied Science, Blackburn, Lancs.
In charge of research: S. Hargraves (Senior Lecturer)

(*a*) The examination of smoke filter papers from the Ministry of

Technology National Survey using spectrographic and atomic absorption methods of analysis.

(*b*) The isolation of hydrocarbons from smoke filter papers using the methods of Gas Chromatography and Thin Layer Chromatography.

University of Dundee

Department of Social and Occupational Medicine
In charge of research: Professor A. Mair.
Epidemiology of asbestosis and mesothelloma in Scotland.

University of Durham

Department of Geography, Science Laboratories, South Road, Durham City.
In charge of research: Professor W. B. Fisher.

Investigation of the relationships between atmospheric pollution and local climate in Tees-side and Co. Durham. Important influences are:

(i) Variable humidities produced by maritime effects.
(ii) Soil character and subsoil.
(iii) Urban "heat islands".
(iv) Winds in relation to local topographic features.

University of Edinburgh

Department of Geography, High School Yards, Edinburgh.
Head of Department: Professor J. Wreford Watson.
In charge of research: Dr. A. J. Crosbie

The initial survey of the pattern of atmospheric pollution in Edinburgh has been followed by an investigation of the influence of relief on microclimates within the city with particular reference to variations in intensity of pollution. Simultaneously, the vertical distribution of pollution on opposite faces of a multi-story tower has been examined.

The next phase of research includes an inventory of emission sources and a survey of the diluting effect of the extensive hill mass of Arthur's Seat, together with a study of vertical temperature gradients over the city.

Meteorological and pollution data are made available for research projects on respiratory diseases in Edinburgh.

Royal College of General Practitioners

Air Pollution Study Group, 14 Princes Gate, London,.S.W.7.
Recorder: Dr. Stuart Carne.

An investigation to determine the effects of atmospheric pollution on the rates of consultation for respiratory diseases, and to relate these to age/sex and the existence of smoking.

Lancaster and Morecambe College of Further Education

Terrisholme Road, Lancaster.
In charge of research: Dr. F. Turner.

A study of the relative importance of marine and urban sources of different airborne salt particles, with particular reference to the respirable fraction. This will include determination of size distribution and chemical composition, and an attempt will be made to correlate results with meteorological factors.

University of Lancaster

In charge of research: Dr. T. A. Mansfield.

Stomata responses to atmospheric pollution.

Liverpool University

Department of Public Health.

In charge of research: Professor A. B. Semple.

Public Health administration with special reference to prevention of atmospheric pollution and the influence of housing on health.

London School of Hygiene and Tropical Medicine

(a) Department of Medical Statistics and Epidemiology, Keppel Street, (Gower Street), London, W.C.1.

Director: Professor D. D. Reid.

Studies of distribution and causation of chronic respiratory diseases. Projects:

(i) Surveys of the prevalence of chronic respiratory disease in populations exposed to the different levels of air pollution in this country as well as to cigarette smoking.

(ii) International studies of prevalence of and the mortality from these disorders in Britain, United States and Norway with particular reference to the experience of migrants from areas of different pollution in Britain and Norway to the United States compared with that of their siblings in the country of origin.

(iii) Surveys of upper and lower respiratory tract disorders in town and country children.

(b) T.U.C. Centenary Institute of Occupational Health, Keppel Street, (Gower Street,) London, W.C.1.

In charge of research: Professor R. S. F. Schilling.

(i) Occupational health; studies of byssinosis and chronic respiratory disease among textile workers, to determine the importance of factors such as pollution outside the factory, smoking and infection in producing disabling disease.
Dr. M. L. Thomson.

(ii) Applied physiology: the measurement of pulmonary function and its application to the detection and evaluation of chronic respiratory disease. At present the role of air pollution is considered in relation to regional differences in the prevalence of industrial dust disease.

(c) In charge of research: Dr. C. N. Davies (a member of the external staff of M.R.C.).

Air flow in human lungs; human inhalation of aerosol; aerosol sampling.

University of London

(a) Department of Chemical Engineering and Chemical Technology, Imperial College of Science and Technology, Prince Consort Road, London, S.W.7.

Head of Department: Professor A. R. Ubbelohde, C.B.E., F.R.S.

In charge of research: Dr. M. G. J. Wilson.

Studies of the distribution of air pollution in cities, and work on atmospheric diffusion in cities.

(b) King's College.
Department of Geography, Strand, London, W.C.2.
In charge of research: Dr. Francis Rose and Dr. P. D. Coker.

A study of the effects of SO_2 pollution on the metabolism of foliose lichen and bryophyte species, using transplantation techniques; the results of this investigation should enable us to construct a series of maps showing levels of SO_2 and other gaseous pollutants in relation to the presence or absence of lichen species whose sensitivity has been established by our experimental work. It is hoped to make use of the "symap" computer mapping programme developed in this Department for the construction of these pollution "contour maps".

(c) Queen Mary College.
Department of Mechanical Engineering.
In charge of research: Professor M. W. Thring.

Atmospheric Pollution—principles of combustion and incineration.

(d) St. Thomas's Hospital Medical School.
Department of Clinical Epidemiology and Social Medicine, London, S.E.1.
Director: Professor W. M. Holland and J. R. T. Colley.

- (i) Study of respiratory disease and respiratory function in young families in six electoral wards of Harrow, chosen to illustrate different environments and social classes.
- (ii) Prevalence of respiratory disease and levels of lung function in school children in four areas of Kent, chosen to represent different levels of atmospheric pollution.

(e) University College.
Urban Climates: Survey, Department of Geography, London, W.C.1.
In charge of research: Dr. T. J. Chandler, (Reader).

A study of urban climates, more particularly the thermal and other characteristics, including pollution, which differentiate them from their rural envelopes. Field surveys in London, Leicester and other towns.

Loughborough University of Technology

Department of Electrical Engineering, Loughborough, Leics.
In charge of research: Dr. J. M. Richards (Lecturer).

A study of partly turbulent diffusive processes in the atmosphere. Liquid model experiments which are now in progress allow improved prediction of the diffusion patterns from instantaneous or continuous sources of pollution under various commonly occurring conditions of atmospheric stratification. Such predictions are being verified by other experiments.

University of Newcastle-Upon-Tyne

Department of Botany, Newcastle-Upon-Tyne 1.
In charge of research: O. L. Gilbert (Senior Demonstrator).

Research into the use of Bryophytes and Lichens as indicators of various types of urban and industrial pollution.

University of Oxford

Genetics Laboratory, Department of Zoology.

Senior Research Officer: Dr. H. B. D. Kettlewell.

(*a*) Evolutionary changes in the colour of Lepidoptera

Evolutionary changes in the colour of Lepidoptera have been brought about by natural selection due to the environment having been directly affected by pollution fall-out. Lichens which are sensitive to it have disappeared and many species of the cryptic Lepidoptera have changed their patterning to all-black colouration both in Britain and in industrial areas of the United States, and elsewhere.

(b) Evolutionary changes in the colour pattern of some Coleoptera.

In charge of research: Dr. E. R. Creed.

A geographic survey of the frequencies of the genetically determined red and black varieties of some species of Ladybird (Coccinellidae) is being undertaken; in the Two-Spot Ladybird there is a strong correlation between the frequency of the black forms and the local smoke concentration.

Plymouth College of Technology

Department of Mechanical Engineering.

In charge of research: E. C. Thomasson and F. J. Woodgate.

Effect of petrol injection on the exhaust pollution caused by internal combustion engines.

Portsmouth College of Technology

Department of Biological Sciences, Hampshire Terrace, Portsmouth, Hants.

Directors: F. N. Haynes and D. I. Morgan-Huws.

Research into the effects of air pollution on lichens, with particular concern for the New Forest and adjacent Southampton Water areas.

Studies on the past and present lichen flora and vegetation of the New Forest.

Queen's University, Belfast

Department of Social and Preventive Medicine.

In charge of research: Dr. G. C. R. Cary.

Respiratory disease in relation to smoking habits and air pollution.

University of Reading

Department of Geography, Reading, Berks.

In charge of research: M. Parry (Senior Lecturer).

(*a*) Data resulting from the survey of 1961-62 are being analyzed. The Geography Department operates one smoke filter/volumetric sulphur apparatus and co-operates, e.g. in supplying meteorological information, with other bodies maintaining similar instruments in the area.

(*b*) Further investigations of meteorological conditions are being undertaken. These include measurements of turbulence at the University Meteorological Station and vehicle traverses across the town of Reading, during which temperature, wind and turbulence measurements are taken.

University of Salford

Department of Civil Engineering, Salford 5, Lancs.

In charge of research: F. L. Thomas and G. Rhodes.

Investigations into techniques of measurement of pollution concentrations, in particular the correlation between results of standard methods of sulphur determination.

University of Sheffield

(a) Department of Fuel Technology and Chemical Engineering, Newcastle Street, Sheffield 1.
In charge of research: Dr. T. B. Brown, Dr. A. B. Hedley and Dr. E. Rothwell.

(i) Formation of oxides of nitrogen in Combustion systems.
(ii) Condensation of sulphuric acid on metal surfaces.
(iii) Filtration of aerosols.

(b) Department of Geography, Sheffield, 1.
In charge of research: Professor A. Garnett.

A detailed survey of air pollution in Sheffield on a geographical and meteorological basis. The work is being done under contract for the Warren Spring Laboratory as part of their programme on the distribution of pollution within towns and is in collaboration with the investigation of the Warren Spring Laboratory in Sheffield.

(c) Department of Preventive Medicine and Public Health.
In charge of research: Dr. J. G. Lunn.

Respiratory study of Sheffield school children in relation to atmospheric pollution data.

University of Strathclyde

(a) Department of Pure and Applied Chemistry, Glasgow, C.1.
Senior Lecturer in Fuel Science: Dr. W. Gibb.

(i) Studies in the suppression of airborne dusts by water sprays and by ultrasonic agglomeration.
(ii) Studies in the formation of oxides of nitrogen in welding processes, and in diesel engines.

(b) Department of Geography, Glasgow, C.1.
In charge of research: R. Moss.

Effects of atmospheric pollution on soils and vegetation.

University of Wales

(a) Cardiff Institute of Science Technology, Cathays Park, Cardiff.
In charge of research: Professor R. W. Edwards.

The effects of air pollution on deciduous woodland in the neighbourhood of a major source of pollution.

(b) Welsh National School of Medicine, Department of Social and Occupational Medicine, The Parade, Cardiff.
Head of Department: Professor C. R. Lowe.

Studies of chronic respiratory disease among steelworkers.

(i) The prevalence of chronic bronchitis among workers in two large steelworks is being estimated by means of a questionnaire, pulmonary function tests, and sickness absenteeism and mortality records and related to:
    (*a*) measurements of particulate and chemical pollution in the works, and

(*b*) measurements of dust, smoke and sulphur dioxide at place of domicile.

(ii) Subsidiary studies include examination of the effect of specific chemical atmosphere pollutants on the plant ecology and pathology in the neighbourhood of the works.

(c) University College of South Wales and Monmouthshire.

(i) Department of Mining, Cardiff.

In charge of research: Dr. I. Farmer.

Election micrographic studies of atmospheric pollution.

(ii) Mineral Exploitation Department.

In charge of research: Professor J. Platt.

Recognition of industrial and other pollutants and pathogenic particles.

A grant for scientific assistance and expenses was awarded by M.R.C. over three years for this project which commenced in 1966.

The Law Relating to Air Pollution

The principal legislation in Great Britain (excluding Northern Ireland) is contained in the Clean Air Acts, 1956 and 1968. The 1968 Act supplements, extends and in part, repeals the provisions of the 1956 Act, known as the principal Act, which superseded the Public Health (Smoke Abatement) Act 1926, which in its turn amended the Smoke Abatement Section of the Public Health Act, 1875.

References to earlier legislation will be found in the chronological history of Air Pollution on page 64.

Several amendments to the domestic (smoke control area) provisions of the Clean Air Act 1956 (the principal Act) were included in the Housing Act 1964.

A Clean Air (Northern Ireland) Act received the Royal Assent in 1964. Its provisions are largely identical with those of the 1956 Act.

Fumes and gases from industrial processes are controlled through the Alkali etc. Works Regulation Act, 1906, administered by the Alkali Inspectorate. Under the Clean Air Acts, smoke, dust and grit emission from certain scheduled processes are also the responsibility of the Inspectorate. (See the section, following on the Alkali etc. Works Regulation Act.)

Apart from the Clean Air Act, it should be noted that action may be taken with regard to smoke or other nuisance from air pollution under common law procedure, and this can be used to secure both damages and an injunction.

In addition to a number of older local Acts containing smoke abatement provisions, over 50 Local Authorities obtained powers, between 1946 and 1956, for the establishment of smokeless zones and/or the optional prior approval of new industrial fuel burning installations. Local authorities may continue to use these provisions unless the relevant sections of their Acts should be repealed, as may be done under Section 35 of the principal Clean Air Act. A number of local authorities have also established smokeless housing estates, where smokelessness is ensured not by legislation but by conditions of tenancy. Pollution from road vehicles is not controlled under any of the clean air legislation, but through the Road Traffic Act and Motor Vehicles Construction and Use Regulations, a description of which is given on a later page.

The Clean Air Acts 1956 and 1968 in Outline

The following outline, which necessarily omits much detail, gives the provisions of the principal Act of 1956 as amended by those sections of the 1968 Act which were brought into force in England, Wales and Scotland on 1 April, 1969, viz Sections 2, 6 and 8 to 15 inclusive together with schedule 1, with the exception of paragraph 2, 5, 8, 9 and 11, and schedule 2.

All sections quoted refer to the principal Act unless otherwise specified.

Section 1 deals with **dark smoke,** defined as shade No. 2 of the Ringelmann scale. Regulations have been issued on the extent to which dark smoke is permitted. It is an offence to emit dark smoke beyond these limits, and the only defences that may be used are specified: lighting up from a cold furnace, unavoidable failure of plant, unavoidable use of unsuitable fuel, and a combination of any of these.

Section 2 has been repealed.

Section 3 requires all **New Furnaces** other than domestic (i.e. less than 55,000 B.T.U.'s per hour) to be as smokeless as practicable. Local authorities must be notified of new installations and may be asked to give prior approval.

Section 4 relates to regulations for the installation of **Smoke Density Recorders,** etc.

Sections 6 to 9 require all furnaces to use means to minimize **Grit and Dust** emissions. It should be noted that Section 2 of the 1968 Act has replaced Section 5 of the 1956 Act which was repealed with effect from 1 April, 1969. The new Section applies to a wider range of furnaces than Section 5 of the principal Act, namely to any furnace burning solid, liquid or gaseous matter, excepting only domestic furnaces with a maximum heating capacity of less than 55,000 B.T.U.'s per hour. One of the objects of extending the provisions of the Section to oil fired and gas fired furnaces is to include those processes where the material being heated forms the major part of the emission. The Section will, for example, apply to furnaces used for such operations as the drying of sand and other powdery materials. Sections 6, 7, 8 of the principal Act have been amended by deletion of the references to "ovens" as ovens for the carbonization of coal are now controlled by the Alkali Inspectorate by virtue of the Alkali etc. Works Act 1966. Section 9 is unchanged. Large new furnaces (burning more than one ton per hour) and all new pulverized fuel furnaces of any size require prior approval for grit arresting equipment to be installed; regulations for measuring and recording grit and dust; supplying local authorities with information about such records; and putting outdoor furnaces on the same footing as those in buildings.

Section 10 of the principal Act, dealing with the **Height of chimneys** is amended by Section 6 of the 1968 Act. The principal Act gives powers to Local Authorities to reject plans for new buildings if chimneys are not sufficiently high, to prevent, as far as is reasonably practicable, nuisance from chimney emissions. Section 6 of the 1968 Act introduces a new control over height of furnace chimneys. Chimneys serving processes not involving the combustion of fuel will continue to be controlled under Section 10 of the principal Act, but Section 10 is repealed in respect of any chimney serving a furnace. The new Section applies to chimneys of all furnaces used to burn pulverized fuel or other solid matter at a rate of 100 lbs. or more an hour or any liquid or gaseous matter at a rate equivalent to $1\frac{1}{4}$ million B.T.U.'s or more an hour. There is no longer any exemption as there was in Section 10 of the principal Act, for London, or for residences, shops or offices.

The definition of "Chimney" is extended by the 1968 Act to include "Flues".

Sections 11 to 15 inclusive concern **Smoke Control Areas** which may be established by local authorities under orders requiring Ministerial approval. Smoke control areas may be entirely smokeless (as with smokeless zones) or may make certain exemptions or impose special conditions. For domestic premises, local authorities may make a grant towards the cost of converting grates etc., to appliances suitable for smokeless use. The authority may recover part of the grant from the central Exchequer and normally the cost of conversion will be borne by owner or occupier and local authority 30 per cent each, Exchequer, 40 per cent.

In a case of smoke emission in a controlled area it is a defence if an authorized fuel only is being burned. Regulations defining authorized fuels have been issued. (Stat. Insts. 1956, No. 2023, 1963 No. 1275 and 1965 No. 1951.)

Section 8 of the 1968 Act gives the appropriate Minister power, after due consultation, to require a local authority to prepare for his approval a programme of smoke control for its area, and upon approval to proceed to carry it out by making smoke control orders.

Section 9 of the 1968 Act strengthens the power of local authorities to enforce smoke control orders. It creates two principal offences in relation to the acquisition and sale of unauthorized solid fuel in smokeless areas.

Section 10 of the 1968 Act strengthens provisions of the principal Act about the procedure for making and bringing into operation smoke control orders. In particular, it prevents a local authority from postponing the date of operation of an order made previously for more than 12 months.

Section 16 of the principal Act deals with **smoke nuisances** from smoke other than smoke emitted from the chimney of a private dwelling or dark smoke emitted from an industrial furnace or plant. In this case it is an offence only when a nuisance to inhabitants of the neighbourhood has been proved.

Section 17 concerns processes that are scheduled as **Special Cases** by Ministerial regulation and in which the control of pollution will be the Alkali Inspectorate and not the local authorities.

Section 11 of the 1968 Act extends the exemption of Premises registered under the Alkali Act and also makes some amendments to the previous regulations.

Section 18 of the principal Act on **colliery spoilbanks** requires the owner of a coal or shale mine or quarry to use all practicable means to prevent combustion of deposited refuse, and to minimize any smoke or fumes that may occur.

Section 19 is to the effect that **railway engines** are subject to dark smoke emission control as if they were buildings.

Section 20 is to the effect that **Dark Smoke from Ships and Vessels** in specified waters shall be controlled as such smoke from buildings. This applies to vessels in any water not navigable to a sea-going ship and in other defined waters. (Stat. Inst. 1958, No. 878) (Scotland: Stat. Inst. 1958, No. 1938 (S.107).)

Section 21 gives a local authority power of **Exemption** from action under the Act, for a stated period, for research or investigation relevant to the problem of air pollution.

Section 22 requires a local authority to report smoke emissions from **Crown Premises** to the Minister responsible for the premises.

Section 23 provides for the setting up of a **Clean Air Council** with the Minister of Housing and Local Government as its Chairman, to review progress and obtain advice on air pollution matters. There is also a similar Clean Air Council for Scotland. (Stat. Inst. 1957 No. 766.)

Section 24 states that **Building Bye-laws** may require the provision in new buildings of such arrangements for heating or cooking as are calculated to prevent as far as practicable the emission of smoke.

Section 25 gives local authorities power to undertake or contribute towards the cost of **Research and Publicity.**

Section 26 relates to the **improper disclosure of information** obtained as a result of administering the Act.

Section 27 deals with **Penalties.**

Section 28 relates to **Authorisation of Works.**

Section 29 deals with **Enforcement** and refers to the powers of local authorities.

Section 30 is procedural and deals with the **Notification of Offences.**

Sections 31, 32 and 33 deal with **administrative and legal** matters.

Section 34 on **Interpretation,** gives the meaning to be applied to a number of words and phrases used in the Act.

Section 35 deals with the **Repeals and Transitions.**

Section 36 excludes **Northern Ireland** from the provision of the Act.

Section 37 gives the **short title** of the principal Act and its dates of its commencement.

The First Schedule of the principal Act relates to the confirmation and coming into operation of orders of local authorities under Section 11.

The Second Schedule consists of amendments to the alkali etc. Works Regulation Act, 1906.

The Third Schedule gives modifications of and, provisions supplementary to, Public Health Acts etc.

The Fourth Schedule lists the enactments which are repealed by the said Act.

The remaining provisions of the 1968 Act which were brought into force on 1 April, 1969 are amendments to definitions, new definitions and other consequential amendments on the 1956 Act.

The remaining provisions of the 1968 Act, namely Sections 1, 3, 4, 5, and 7 and the remainder of Schedule 1, will be brought into operation by a further Commencement Order or Orders as in due course and as announced by the Ministry of Housing and Local Government:

Section 1 of the 1968 Act deals with the prohibition of dark smoke from industrial or trade premises.

Section 3 deals with the requirement to fit arrestment plant to new furnaces.

Section 4 specifies exemptions from such requirements.

Section 5 deals with the measurement of grit, dust and fumes omitted from furnaces. Section 7 deals with the application to fumes of certain provisions as to grit and dust.

Full details of the Commencement Order or Orders enacting the above Sections of the 1968 Act will be given in the issue of *Smokeless Air* published immediately after enactment. A summary of the provisions of the two Clean Air Acts will be included in this section of the next *Clean Air Year Book.*

The Housing Act, 1964

The Clean Air Act, 1956, was amended in respect to dwellings (sections 11 to 15) by section 95 of the Housing Act, 1964. This section is divided into nine subsections, which may be summarized as follows:

(1) A new dwelling is defined as one begun on or after 16 August, 1964. (2) and (3) Local authorities may designate as unsuitable, appliances for which suitable fuels are not fully available in the area. (4) and (5) give local authorities discretionary powers in relation to payment of grants in certain special cases. (6) (7) and (8) provide for the extra cost of discretionary in case of hardship, etc., to be shared between the local authority and the Exchequer. (9) provides for grant

to be paid for means for the ignition of solid fuels even if "works" are not involved, which was not previously the case.

For a full description and commentary on these amendments reference should be made to the Ministry of Housing circular No. 46/64.

Clean Air Act Regulations

Authorized Fuels

The Smoke Control Areas (Authorized Fuels) Regulations came into force on 31st December, 1956. These relate to section II of the Clean Air Act, which provides for a defence in the case of smoke emission from a building in a smoke control area if it is proved that the smoke " was not caused by the use of any fuel other than an authorized fuel." The fuels authorized in the regulations are: anthracite, briquetted fuels carbonized in the process of manufacture, coke, electricity, gas, low temperature carbonization fuels and low volatile steam coals.

Liquid Fuels

The Building Regulations described below do not include appliances for the use of liquid fuels, nor do the Authorized Fuel Regulations include liquid fuel as an authorized fuel. The Smoke Control Areas (Exempted Fireplaces) Order, 1957, exempts from control under section 11 of the Clean Air Act fireplaces designed or adapted for the combustion of liquid fuel, " provided they are so installed, maintained and operated as to minimize the emission of smoke." Under section II the Minister may make Orders exempting from control in smoke control areas any fireplace that he is satisfied can be used without producing any substantial quantity of smoke when burning other than an authorized fuel. The Order therefore allows for the use of oil-burning appliances in smoke control areas, and also has the effect of allowing such appliances to be included among those permitted under the Building Regulations.

It should be noted that although the use of oil is thus permitted in smoke control areas and under the Building Regulations, oil remains a non-authorized fuel, so that in case of smoke emission from an oil-burning installation in a smoke control area the authorized fuel defence could not be used.

Mechanical Stokers

The Smoke Control Areas (Exempted Fireplaces) Order, 1959, exempts mechanical stokers from smoke control area orders in the following terms: "Fireplaces, other than fireplaces fired by pulverized fuel, constructed on or after the 31st day of December, 1956, and equipped with mechanical stokers, or adapted on or after that date for use with such stokers," on condition that "the fireplace shall be so installed, maintained and operated as to minimize the emission of smoke. No fuel shall be used other than that for which the mechanical stoker was designed."

Appliances

The Exempted Fireplaces Order, 1959, also exempts two specified appliances: the Solid Fuel Ductair Unit, manufactured by Radiation Ltd., and the Fulgora Slow Combustion Stove, manufactured by Fulgora Stoves, Ltd., on condition that they "shall be so installed, maintained and operated as to minimize the emission of smoke, and in any case in accordance with the manufacturers' instructions." In the case of the Fulgora Stove it is also a condition that "no fuel shall be used other than wood waste in clean condition." A new, 1966, Order exempts the Hounsell Sawdust Burning Stove with similar conditions.

Firelighting by Sticks and Paper

Circular 28/60 of the Ministry of Housing and Local Government states that while gas remains the best and most convenient means of lighting solid smokeless fuels in smoke control areas, there will be houses which cannot be supplied with gas at a reasonable cost and also some people may object to having gas at all. For the present, therefore, the Minister accepts that the small amount of smoke caused in this way must be accepted in the general interest of making progress with the creation of smoke control areas.

" The Minister thinks that legal cover for the use of sticks and paper for lighting fires can best be given by the use in smoke control orders of the power of exemption in section 11(3) of the Clean Air Act, 1956. Local authorities could give an exemption in general terms extending to fireplaces in any building or separately occupied parts of a building which is not supplied with town gas; or alternatively, they could give a specific exemption to named individual premises. Either type of exemption should be subject to a condition to secure that it would have effect only where authorized fuels or kindling sticks and paper were being used ".

The Minister asks that such exemption should be included where it is apparent that some buildings or parts of buildings will remain without a gas supply. He also asks that if a local authority should decide not to include an exemption along these lines in such a case, then they should give an explanation when submitting the order for confirmation.

Building Regulations

Prevention of Smoke Emission

The Building Regulations, 1965, include a section, M2, relating to the prevention of emission of smoke. This supersedes the earlier byelaw on the subject. The full text of the section is:

M2. In any building (other than a building erected under former control) there shall not be installed for the purposes of heating or cooking in that or any other building any appliance which discharges the products of combustion into the atmosphere, unless that appliance is designed to burn as fuel either gas, coke, or anthracite:

Provided that nothing in this regulation shall prohibit the installation of:

(i) a furnace which complies with Section 3 of the Clean Air Act 1956; or

(ii) any appliance of a class exempted conditionally or unconditionally from the provisions of Section 11 of the Clean Air Act 1956 (which relates to smoke control areas) by any order for the time being in force under subsection (4) of that section; or

(iii) a solid fuel appliance with a bottom grate unsuitable for burning coke or anthracite but designed so as to be capable of use with an alternative bottom grate which is suitable for burning such fuel.

Dark Smoke Regulations

In Statutory Instrument 1958, No. 498, " The Dark Smoke (Permitted Periods) Regulations, 1958," the Minister of Housing and Local Government has made the regulations required for the operation of Section 1 (2) of the Clean Air Act. The Regulations permit the following:

(i) Not more than 10 minutes dark smoke emission in the aggregate from any chimney in any period of 8 hours.

(ii) This permitted time extended to 14 minutes if soot blowing is carried out within the 8 hour period.

(iii) The 10 and 14 minutes to be extended for chimneys serving more than one furnace as follows:
A chimney serving 2 furnaces, 18 and 25 minutes respectively;
a chimney serving 3 furnaces, 24 and 34 minutes respectively;
a chimney serving 4 or more furnaces, 29 and 41 minutes respectively.

(iv) A continuous emission of dark smoke from the chimneys of factories (other than that caused by sootblowing) for a period not exceeding 4 minutes.

(v) The emission of black smoke up to 2 minutes in the aggregate in any period of 30 minutes.

The regulations apply to dark smoke from the chimneys of factories, shops, offices and railway engines, but not to dark smoke from the funnels of ships, for which separate regulations have been made, as set out below.

Dark Smoke (Permitted Periods) (Vessels) Regulations

These regulations, under s.1(2) of the Clean Air Act, are contained in Statutory Instrument 1958, No. 878. They specify the periods within which dark smoke is permitted from vessels in various classes of case, as detailed in the schedule below. The phrases in italics, "10 minutes in 2 hours", etc., mean that 10 minutes emission of dark smoke *in the aggregate* is permitted in any period of 2 hours.

Schedule—Classes of Case

1. Emissions from a forced draught oil-fired boiler furnace, or an oil engine. 10 *minutes in* 2 *hours.*

2. Emissions from a natural draught oil-fired boiler furnace (except in the cases falling within class 4 below). 10 *minutes in* 1 *hour.*

3. Emissions from a coal-fired boiler furnace:
   (*a*) when the vessel is not under way (except in the cases falling within class 4 below). 10 *minutes in* 1 *hour.*
   (*b*) when the vessel is under way. 20 *minutes in* 1 *hour.*

4. Emissions from a natural draught oil-fired boiler furnace or a coal-fired boiler furnace in the following cases:
   (*a*) a vessel with funnels shortened for the purpose of navigating the Manchester Ship Canal;
   (*b*) a tug not under way, but preparing to get under way or supplying power to other vessels or to shore installations;
   (*c*) a vessel not under way but using main power for the purpose of dredging, lifting, pumping or performing some other special operation for which the vessel is designed. 20 *minutes in* 1 *hour.*

5. Emissions from any other source. 5 *minutes in* 1 *hour.*

In addition, *continuous* dark smoke caused otherwise than by the soot-blowing of a water-tube boiler, shall not exceed:

(1) in the case of classes 1 and 2 above, 4 *minutes.*

(2) in the case of natural draught oil-fired boiler furnaces in class 4, 10 *minutes.*

Further, in *no case* shall black smoke (Ringelmann 4) be emitted for more than 3 *minutes* in the aggregate in any period of 30 *minutes.*

The Alkali, etc., Works Regulation Act

The Alkali, etc., Works Regulation Act, 1906, consolidates and extends previous similar Acts, the first of which was passed in 1863.

The Act includes a schedule of chemical processes and a list of noxious or offensive gases. Since 1906, this schedule and list have been extended by Statutory Orders made under the Public Health (Smoke Abatement) Act, 1926 and the Alkali, etc., Works Regulation (Scotland) Act, 1951. Such orders were made in 1928, 1935, 1939, 1950, 1958, 1961, 1963 and 1966.

The essence of the Act lies in the requirements that (1) scheduled processes must be registered annually, (2) as a prior condition in the case of a first registration the scheduled process must be provided to the satisfaction of the Chief Inspector with the " best practicable means " for preventing the escape of noxious or offensive gases to the atmosphere and for rendering such gases harmless and inoffensive, (3) the

" best practicable means " must thereafter be maintained in good and efficient working order and must be operated continuously, (4) in the case of certain processes, upper limits are specified for the concentration of total acidity in effluent gases which may be discharged to the atmosphere.

Provision is made for the setting up and maintenance of an inspectorate to administer the Act, and regulations are included relating to the registration and inspection of works, general procedure, penalties, etc. The Chief Inspectors are required to make an Annual Report to be laid before Parliament, relating to the work of the inspectorate.

Under the Clean Air Act, 1956, the provisions of the Alkali Act are extended to apply to smoke, dust and grit from premises controlled under the Act as they already do to noxious or offensive gases. Thus from 31st December, 1956 virtually all forms of air pollution from processes registered under the Alkali Act will be subject to control under that Act by the Alkali Inspectorate. Any other parts of a work are the responsibility of the local authority.

The Alkali, etc., Works Orders

The first four Orders dealt mainly with processes in the heavy chemical and related industries where noxious or offensive gases are the potential offenders. In an Order which came into operation on 1 June 1958 the Minister of Housing and Local Government further extended the Alkali Act by adding to the list of scheduled processes a number which are responsible principally for emissions of smoke, grit and dust. Among these processes are a number for the production of iron and steel, iron or steel melting processes, and some copper and aluminium processes. Gas and coke works, electricity works, coal fired producer gas plant and lime kilns and certain ceramic kilns fired by coal or oil were also added to the list together with sulphate reduction and caustic soda plant and certain types of chemical incinerators. The Order also made the appropriate additions to the list of noxious or offensive gases.

The 1961 Order deals with emissions from the processing of uranium, beryllium, selenium and their compounds. The 1963 Order is much more comprehensive and was prepared largely to take into account the major changes which have taken place in recent years in the heavy chemical and allied industries. It also covers the burning of scrap cable to remove the insulation. This is necessary because of the increasing amount of cable covered with polyvinyl-chloride, which, on burning, gives rise to hydrochloric acid, chlorides and possibly phosgene. The Order begins the policy of descheduling certain of the 1958 Order smoke processes.

The 1966 Order is important, for in addition to making a few minor alterations to the lists of scheduled works and noxious or offensive gases, it revokes all the earlier seven Orders and consolidates them in the 1966 Order. Thus, all the Alkali Acts and Orders since 1863 are consolidated in the 1906 Act and the 1966 Order.

The Clean Air (Measurement of Grit and Dust) Regulations 1968

These Regulations came into force on 1 May, 1968. They enable local authorities to require the making and recording of measurements of grit and dust emitted from a furnace or oven covered by Section 7(1) of the Clean Air Act of 1956, the provision of the necessary apparatus and the supply to the local authority of the results of the measurements. The Ministry of Housing and Local Government suggest that when local authorities examine plans for furnaces or chimneys for the purposes of Section 6(1) and 10(1) of the Act, they should consider whether they are likely to make a direction under Section 7 in respect of the furnace or oven concerned, and whether they should advise the firm to incorporate appropriate sampling points in the course of construction.

The Clean Air (Measurement of Grit and Dust) (Scotland) Regulations 1968

These Regulations came into force on 2 September, 1968, they enable local authorities to require the making and recording of measurements of grit and dust emitted from a furnace covered by Section 7(1) of the Clean Air Act of 1956, the provision of the necessary apparatus and the supply to the local authority of the results of the measurements.

It is suggested that, when local authorities examine plans for furnaces or chimneys for the purposes of Sections 6(1) and 10(1) of the Act, they should consider whether they are likely to make a direction under Section 7 in respect of the furnace concerned and whether they should advise the firm to incorporate appropriate sampling points in the course of construction.

Clean Air Act (Northern Ireland) 1964

Regulations, dated 28 January, 1969, made by the Ministry of Health and Social Services under Section 23(1) of the Clean Air Act (Northern Ireland) 1964 came into force on 1 March, 1969.

They state that in any new building in certain areas specified in the schedule of places which includes Belfast, Londonderry, nine Boroughs, 13 Urban Districts and 13 Rural Districts, no appliances for heating or cooking may be fitted unless the appliance is designed to burn as fuel either gas, hard coke or anthracite.

Chimney Heights

Under Section 6 of the 1968 Clean Air Act which came into force on 1 April, 1969 when:

(i) a new chimney is built to serve a new or existing furnace,

(ii) a furnace served by an existing chimney is enlarged, i.e. when its combustion space is increased,

(iii) a furnace served by an existing chimney is removed and replaced by one having a larger combustion space,

the occupier of the building, or the person having possession of a boiler or industrial plant commits an offence if he uses the furnace without having obtained the approval of the local authority for the height of chimney; or if he fails to comply with one or more conditions subject to which approval has been conferred.

If the local authority fail to give the applicant a written determination of his application within four weeks it is deemed to have been approved without qualification unless a longer period has been agreed with the applicant in writing.

In referring to the guidance on chimney heights given in the Ministry of Housing and Local Government, Scottish Development Department and Welsh Office 2nd edition (1967) of the 1956 Clean Air Act Memorandum on Chimney Heights, the Explanatory Memorandum comments that the Memorandum recognizes that emissions of sulphur dioxide below 3 lbs. per hour are trivial and do not involve special consideration of the question of chimney height. Whilst it is true that such small emissions may be negligible so far as sulphur dioxide is concerned, some small installations burning 35 seconds oil could give rise to nuisance from odour and accordingly the chimney height for such an installation would be best determined with regard to the surroundings rather than the sulphur dioxide emission.

An approval under this Section may be granted without qualification or subject to conditions as to the rate of quality, or the rate and quality, of emissions from the chimney.

The perameter "SO_2 emission pounds per hour" as used in the Memorandum on Chimney Heights appears to be appropriate for use in specifying a condition of this kind.

If a local authority refuses approval of the proposed chimney height or attaches conditions to their approval, they must inform the applicant in writing, stating their reasons, and in the case of a refusal stating the lowest height which they would be prepared to approve, either unconditionally or subject to specified conditions. The applicant then has a right of appeal to the Minister.

The measurements made as part of the National Survey of Air Pollution indicate that chimney heights determined in accordance with the guidance given in the 1967 Memorandum on Chimney Heights are adequate to prevent prejudice to health or nuisance from emissions of sulphur dioxide.

This 1967 Chimney Height Memorandum is published by H.M.S.O. at 2s. 6d. nett. The calculations required first take account of the amount of sulphur dioxide emitted per hour and assume that the efflux velocity of the flue gases will not be less than that indicated for different types of installation. The guide then shows how the "uncorrected chimney height" may be calculated. This is the height appropriate for the relevant maximum rate of SO_2 emission when account has been taken of the neighbouring sources of pollution, the local background level of pollution and the general character of the district.

A key of five different types of district is given and by the use of nomograms the uncorrected chimney height for very small, small, medium and large installations can be read off. If the uncorrected chimney height thus determined is not less than 2½ times the height of the building to which the chimney is attached, or any other building in the immediate vicinity, no further correction need be made. If, however, the uncorrected height is less than 2½ times the height of such buildings a further correction has to be made. This correction is partly based on the ratio between the greatest length and height of the building (to the ridge), since this influences the effect of downdraughts.

On a further nomogram a line is taken from the uncorrected chimney height through a point representing the building height to a reference line. From here another line is drawn through a point representing the height of the building or its greatest length, whichever is lower, to a point indicating the final height.

A further nomogram deals with final heights for very small furnaces.

Grant Arrangements

A circular of the Ministry of Housing and Local Government (51/65) of June 1965 introduced important modifications to the grant arrangements in smoke control areas following the changes made in Circular 69/63. This followed the report on domestic fuel supplies and permitted grants to be made on openable stoves or roomheaters, and equivalent appliances using other fuels. Difficulties arise in the interpretation of what is "reasonably necessary" and are said to have involved both the local authorities and the department in a great deal of correspondence.

This circular has now been amended by Circular No. 25/66 to take account of new appliances, increases in costs and developments in the testing of electric storage heaters.

The circular lists the cost limits for various types of appliances. 19 items are listed as an appendix, and as they are of especial general interest the list is quoted in full below.

It is for the local authority to decide, within the appropriate cost level, what costs are reasonable in each case. The Minister will accept as qualifying for Exchequer contribution expenditure which is acceptable to the local authority and which falls within the limits shown in this list, but he will not normally accept any portion of the cost (excluding installation cost) which exceeds the stated limit.

It is pointed out that it remains a principle that facilities of a standard approximately equal to that of existing facilities should be provided, but that extra costs should not be incurred solely to provide higher standards. It is pointed out that the installation of a modern smokeless appliance in place of a coal-burning fireplace may incidentally provide a higher standard of heating, but that this will not preclude grant on the full payment.

A number of other matters are referred to, and a further appendix revises paragraph 26 of the Ministry's Memorandum on Smoke Control Areas, in which reference is made to the changes arising from S.95 of the Housing Act, 1965.

By Circular No. 36/68 issued in June 1968, the Minister of Housing and Local Government announced his intention of revoking the designation of direct acting electric space heaters. These appliances therefore became eligible for grant for new smoke control areas; grants are not payable, however, on expenditure on these appliances incurred before the designation was formally revoked.

Smoke Control Area Grants; Cost Limits for Various Appliances (Circular 25/66)

	£
Improved open fire (including integral gas ignition and, where necessary, deepening plate and bar)	6
Improved open fire (including integral gas ignition and, where necessary, deepening plate and bar) with boiler	17*
Underfloor draught fire and fan-assisted open fire	17
Underfloor draught fire and fan-assisted open fire with boiler	23*
Solid fuel room heater	26
Solid fuel room heater with boiler	36*
Gas room heater	24
Electric thermal storage heater	29
Oil room heater	16
Solid fuel cooker with boiler	60
Gas or electric cooker	35
Independent solid fuel boiler, **including installation**	25
Gas water heater (e.g. gas circulator and back boiler unit), **including installation**	25
Electric immersion water heater, **including installation**	15
Wash boiler, gas and electric	13
Gas poker, including flex and tap	2
Bottled gas igniter, if gas container is hired	3
Bottled gas igniter, including purchase of gas container	6
Electric kindler	8

* £2 may be added where

(i) it would be impossible or inadvisable to connect the existing boiler to the new space-heating appliance,

and

(ii) either

(*a*) the existing boiler is itself bower-barffed or made of stainless steel, copper, aluminium, bronze or other superior material,

or

(*b*) one of the above types is necessary to comply with local water bye-laws.

Road Traffic Pollution Law

The Statutory Regulations governing the emission of smoke or other forms of pollution from road vehicles are made by the Minister of Transport and Civil Aviation in exercise of the powers conferred on him by sections 3, 17, 30, and 111 of the Road Traffic Act, 1930 (20 & 21 Geo.5.c.43.).

The Regulations at present operative are known as "The Motor Vehicles (Construction and Use) Regulations 1966. (Statutory Instruments 1963, No. 1646)." Under Part IIA. of the Regulations, governing the construction, weight and equipment of vehicles, Regulation 22 (Emission of smoke or vapour), states:

"Every motor vehicle shall be so constructed that no avoidable smoke or visible vapour is emitted therefrom."

Regulation 23(1) includes compression ignition (i.e., diesel) engines in the words "motor vehicles", and (2) requires excess fuel devices to be so fitted that they cannot be operated by a person while he is being carried by the vehicle, unless (a) such a device cannot be used after the engine has been started, or (b) does not cause any increase in smoke or visible vapour.

Part III of the Regulations governs the Use of Vehicles. Regulation 83 states:

"No person shall use or cause or permit to be used on a road any motor vehicle from which any smoke, visible vapour, grit, sparks, ashes, cinders, or oily substance is emitted if the emission thereof causes or is likely to cause damage to any property of injury to any person who is actually at the time or who reasonably may be expected on the road, or is likely to cause danger to any such person as aforesaid".

Regulation 84 relates to the use of the excess fuel device, and requires such a device to be so maintained that it does not cause the engine to be supplied with excess fuel while the vehicle is in motion on a road; nor allows any person so to use it.

Major Smog Disasters

The word "smog" was first used by the late Dr. H. A. Des Vœux, founder, president of the N.S.A.S., in 1905, to denote the combination of smoke and natural fog that in urban areas may have disastrous consequences. There are numerous cases of smog conditions resulting in a marked rise in mortality and morbidity from respiratory disorders and consequential cardiac failure. Among these incidents are the following.

London, 1873. Rise in bronchitis deaths, compared with the previous week, of 268.

London, 1880. Rise in bronchitis deaths, compared with the previous week, of 692.

London, 1891. Rise in bronchitis deaths, compared with the previous week, of 572.

Glasgow, 1909. Average number of deaths in the three weeks prior to the fog were 57 per week. During five weeks of fog or haze the deaths per week were: 138, 233, 171, 198 and 137.

Manchester and Salford, 1930-31. In December, with no fog, there were 137 respiratory disease deaths. In January there were nine days heavy fog and 592 deaths.

Meuse Valley, 1930. 60 deaths attributed to fog, the death rate rising to 10·5 times the normal. Many cattle had to be slaughtered.

London, 1948. Bronchitis deaths in week before fog, 73; in the week of fog, 148.

Donora, U.S.A., 1948. 18 deaths in a population of 14,000. 42 per cent of the population were estimated to have suffered from illness.

London, 1952. The fog developed on Friday, 5 December and continued until 8 December. Estimated total of 4,000 deaths in the Greater London area. In the Administrative County only deaths from bronchitis rose from 121 to 872, and from heart and circulatory diseases, from 318 to 801.

London, 1956. 1,000 additional deaths attributed to January fog in the Greater London area. (*B.M.J., 31 March, 1956.*)

London, 1962. Fog in London and other areas, December 3-7, with similarities to the 1952 fog, but with 750 additional deaths as compared with 4,000.

Principal References

Mortality and Morbidity during the London Fog of December, 1952. Ministry of Health Public Health Report No. 95. (This report contains a section on "Previous Fog Incidents", with a statistical appendix for those in London.)

Les Problèmes de Pollution de l'Atmosphère, Batta, Firket and Leclerc, Liége, 1937.

Air Pollution in Donora, Pa. Public Health Bulletin, No. 306, Federal Security Agency, Public Health Service, Washington.

Solid Smokeless Fuels

All solid smokeless fuels are manufactured for specific purposes for use in blast furnaces, foundry cupolas and for the domestic market. The fuels vary according to the type of coal from which they are made and the method of carbonization. Certain of the domestic fuels are manufactured to a British Standard Specification and are carefully graded in size to ensure their suitability for a wide range of domestic appliances.

The authorized solid smokeless fuels are as follows:

Anthracite

Anthracite, obtained mainly from South Wales, is characterized by its hard and bright appearance and is distinguished by its high carbon and low volatile matter content.

It is a suitable fuel for roomheaters, boilers and cookers in which it will burn for many hours without attention. The small sizes of Anthracite, peas, beans or grains, are used on gravity feed boilers.

Low Volatile Steam Coal

There are two categories of Low Volatile Steam Coal:

(a) Welsh Dry Steam Coal, which differs only slightly from Anthracite from visual inspection. It has a relatively high carbon content although its volatile content is slightly higher than Anthracite. It is suitable for use in roomheaters, boilers and cookers on which it will burn for many hours without attention.

(b) A low volatile coal with a slightly higher volatile content than the Welsh Dry Steam Coal is suitable for use in open fires. It has a high bulk density and the replenishment of the fire need not be so frequent as with lighter fuels. This fuel known as Lovol is mainly available in South Wales and the West of England.

Phurnacite

Phurnacite is carbonized ovoids made from specially selected and prepared Welsh Dry Steam Coal.

Most of the volatile content is removed during the manufacturing process. The resulting smokeless ovoids burn for long periods without attention, are completely free of stone or shale and are suitable for use in room heaters, boilers and cookers.

The ovoids are extremely hard so that breakage and the formation of "fines" during transit is unlikely.

BurnBrite

This fuel is manufactured in coke ovens from specially selected prepared coal at a lower temperature and for a shorter period than other products from coke ovens and is suitable for the improved open fire. Smaller sizes can be burned in roomheaters, boilers and cookers.

BurnBrite is available in London, the Midlands, North Western, South Yorkshire and Northern Areas and parts of Scotland.

Cleanglow and Phimax

These fuels are produced by different area gas boards in continuous vertical retorts from specially selected coals. Cleanglow is available in most parts of the country though Phimax is only available in the North West.

Cleanglow and Phimax are suitable for use on the open fire, are easy to ignite and burn with a flame.

Coalite and Rexco

Coalite and Rexco are manufactured from two different low temperature carbonization processes. They burn with a cheerful flame, are easy to ignite and are very reactive fuels. They are suitable for open fires; smaller sizes are suitable for roomheaters, boilers and cookers.

Gloco

This fuel is produced to a British Standard Specification by the Carbonization of selected coal and is carefully prepared for use in open fires which are specified for use with coke and preferably fitted with gas ignition. This fuel will not burn in old fashioned grates.

Gas Coke manufactured in continuous vertical retorts also comes within this category and is suitable for use on the open fire.

Smaller sizes of these fuels are suitable for roomheaters, boilers and cookers.

Homefire

Homefire is a six-sided briquette about three inches in diameter. It has much the density of coal and a very low ash content.

It is a reactive fuel burning with a bright flame and is produced by the National Coal Board at Coventry. This fuel is eminently suitable for all open fires and at present is available in all Regions except Scottish, Northern and South Wales.

Multiheat

Mild heat treatment briquettes being produced at the Crown Fuel Works in Cardiff. They have anthracite as a main constituent and are manufactured by the National Coal Board.

Multiheat briquettes are ovoid in shape, strong and dense. This fuel is designed for use in roomheaters and boilers except for heat storage cookers and hopper fed appliances and can be used on most open fires. Supplies are available mainly in the South of England, the South West, the Midlands and the North West.

Sunbrite

Sunbrite a British Standard Specification fuel is a hard coke produced by the carbonization of selected coals at a high temperature in coke ovens. It is carefully prepared and selected for domestic heating appliances.

It is manufactured by the National Coal Board, the Steel Companies and the Independent Coke Producers.

Sunbrite is suitable for use in roomheaters, boilers and cookers, fires with under-floor primary air for combustion and fan-assisted open fires. It is available in all parts of the country.

Warren Spring

The Work of the Warren Spring Laboratory of the Ministry of Technology on the Investigation of Air Pollution and its Abatement.

Warren Spring Laboratory carries out research on the nature and extent of air pollution, and on its prevention and abatement, in order to provide technical information necessary for the administration of clean air legislation, for town planning and the location of industry, and for research into the effects of air pollution.

The National Survey of Air Pollution

The National Survey, devised by Warren Spring Laboratory, is planned statistically to enable valid conclusions to be drawn on the incidence of air pollution in urban areas throughout the country, while restricting observations to a reasonably small number of sites. Some 120 towns were chosen for the purpose and each agreed to make daily measurements of smoke and sulphur dioxide in the following five types of districts, in so far as examples are to be found in each town:

(a) Residential area with a high population density, such as old terrace housing.
(b) Residential area with a low population density, such as a housing estate or suburb.
(c) Industrial area.
(d) Commercial area, with central heating predominating.
(e) Smoke control area, which may be any of the above types.

Observations are also being made at a number of sites in the depth of the country to give background information. All sites for the survey were chosen by the local authority in collaboration with Warren Spring Laboratory, and on 1 April, 1969, observations for this statistically-planned part of the Survey were being made by 115 authorities operating 373 instruments and a further 33 authorities in the area administered by the Greater London Council operating 146 instruments.

In addition, a further total of 289 local authorities and others were making daily observations of smoke and sulphur dioxide at 528 sites. These measurements are being made on the initiative of the authorities concerned, and primarily for their own local purposes, but they form a second part of the National Survey and comparison of these results with the national averages established by the first part of the survey will be of great value.

Under part three of the Survey a further 163 sites were operated by 60 authorities in rural areas, to provide data on drift of pollution and background information.

Other Measurements of Air Pollution

In addition to the daily smoke and sulphur dioxide observations, many local authorities and other bodies make monthly measurements of grit-and-dust-fall, using the British Standard Deposit Gauge, and of the rate of reaction of sulphur compounds with lead dioxide. Warren Spring Laboratory continues to give advice and help in connection with such measurements.

Standing Conference of Co-operating Bodies

All local authorities and other organizations who make measurements of air pollution, either as part of the National Survey or purely for their own local purposes, and who submit the data regularly to Warren Spring Laboratory for publication, are entitled to send representatives to the Standing Conference of Co-operating Bodies. This Conference meets twice yearly to discuss matters of interest connected with air pollution. Other bodies may do so on payment of a subscription. At 31 March, 1969, 438 bodies had appointed representatives to the Conference.

Publication of Results

All data submitted to the Laboratory are collated, and summaries are published. The section which deals with daily measurements of smoke and sulphur dioxide is published monthly and that dealing with measurements made with the deposit gauge and the lead dioxide instrument is published at six-monthly intervals. Annual Summaries of the data are also published.

Abstracts of papers and other information on air pollution are also published monthly.

These Summaries and Abstracts are available on request to all concerned with problems of air pollutions.

In addition, a series of Reports on the Investigation of Atmospheric Pollution published by H.M. Stationery Office, give analyses of these results and an account of research on the measurement and abatement of air pollution.

The last in this series, the 32nd Report, brings the position up to date to 1966, and gives, in addition, an account of the changes in the administrative arrangements.

A start has now been made on the assessment of the data of the National Survey. A report on South East London and South East England was presented to the Standing Conference in November 1968 and a Report on South Lancashire was presented in June 1969. A report on similar lines on Northern Ireland was presented to the Northern Ireland Section of the Society in May 1969.

Instruments

Work by the Laboratory on the calibration of the daily smoke filter and on the accuracy of the daily hydrogen peroxide method for sulphur dioxide has now led to British Standard Specifications on both methods and to their acceptance internationally by the Organization for Economic Co-operation and Development (O.E.C.D.).

A new directional sampler has been developed which will sample only when the wind is in a specified direction and above a specified speed.

Effort is now concentrated on the automation of recording stations so that the data from continuous or other recorders can be fed directly into a computer, or into the Post Office telephone system so that if the right number is dialled the readings of the recorders are reproduced on dials at the receiving end.

Town Planning Studies

In the past few years it has become increasingly apparent that while it is quite impracticable to control the amounts of sulphur oxides in the air by limiting their emission (as is done for smoke under the Clean Air Act), it is, nevertheless, possible to make great improvements by taking full advantage of natural dispersion processes. This can be done by the proper design of chimneys in relation to buildings and the proper siting of the various types of residential district in relation to each other and to industrial installations. A great deal of effort is being devoted to obtaining sufficient knowledge of the distribution and spread of pollution in urban areas to enable town planners to do their work satisfactorily from an air pollution point of view.

While the National Survey provides information on the distribution of pollution in urban areas this is being supplemented by special investigations. Thus a survey in Sheffield is being undertaken in co-operation with the Department of Geography of the University to examine the build-up and dispersion of pollution over the city. The effects of topography, weather conditions, and relation of industry to housing are being examined.

A similar survey is also being undertaken as part of the programme of the Warren Spring Laboratory by the Department of Geography of the University of Edinburgh to investigate the different conditions in that city.

The general problem of the ventilation of cities is being studied in London by observations at various heights on the Post Office Tower. Laser equipment has been purchased and is now coming into operation to study the dispersion of particulate matter over cities.

A great deal of advice on the siting and heights of chimneys is given both to local authorities and to firms. Often the giving of advice is difficult unless the results of tests made on a model in a wind-tunnel are available. A suitable tunnel is now being built so that these tests can be undertaken. The tunnel will also be used to obtain more basic information on dispersion from chimneys.

Removal of Noxious Compounds from Flue Gas

While it is recognized that it would be impracticable, economically and technically, to contemplate the universal application of methods of removing sulphur compounds from flue gas, it is considered that if a suitable process were available it might have limited but important applications. Work is now in progress on the possibility of abating the nuisance from one particularly troublesome type of emission, namely the evil smelling flue gas from brickworks in the Bedfordshire-Buckinghamshire area.

British Standards relating to Air Pollution

B.S.

758 Small domestic hot-water supply boilers using solid fuel.
Part 1. Manually-controlled boilers.
Part 2. Thermostat-controlled boilers.

893 Method of testing dust extraction plant and the emission of solids from chimneys of electric power stations.

1251 Open fireplace components.
Part 1. Firebacks for use with inset open fires.
Part 2. Fireplace surrounds and hearths.
Part 3. Adjustable chimney-throat restrictors (insertible).
Part 4. Lintels.

1252 Domestic solid fuel cookers with integral boilers.

1334 Thermal insulating materials.

1747 Methods for the measurements of air pollution.
Part 1. Deposit gauges.
Part 2. Determination of concentration of suspended matter.
Part 3. Determination of sulphur dioxide.
Part 4. The lead dioxide method.

1756 Methods for the sampling and analysis of flue gases.
Part 1. Methods of sampling.
Part 2. Analysis by the Orsat apparatus.
Part 3. Analysis by the Haldane apparatus.
Part 4. Miscellaneous analyses.
Part 5. Semi-routine analyses.

2740 Simple smoke alarms and alarm metering devices.

2741 Recommendations for the construction of simple smoke viewers.

2742 Notes on the use of the Ringelmann chart.
C: 1957 Ringelmann chart.
M: 1960 Miniature smoke chart.

2811 Smoke density indicators and recorders.

2845 Coke-burning inset open fires without boiler and without convection.
Part 1. Dimensional and constructional requirements.
Part 2. Performance and constructional requirements.

2978 Measurements of smoke emission from industrial boilers.
Part 1. Medium capacity coal-fired water-tube boilers with travelling grates.
Part 2. Coal-fired shell boilers with various types of mechanical stokers.

3107 Small incinerators for the destruction of hospital dressings.

3128 Constructional and performance requirements for inset open fires with boiler and without convection.

3142 Manufactured solid smokeless fuels for household use.
Part 1. Cokes for domestic open fires.
Part 2. Cokes for domestic closed appliances.

3250 Thermal testing of domestic solid fuel burning appliances with convection.
Part 1. Flue loss method.
Part 2. Hood method.

3316 Large incinerators for the destruction of hospital waste.

3328 Domestic gas pokers and portable underbar ignition burners.

3376 Open fires with convection, with or without boiler.

3377 Back boilers for domestic solid fuel appliances.

3378 Domestic heating stoves using coke and other solid fuels.

3405 Simplified methods of measurement of grit and dust emission from chimneys.

3813 Incinerators for waste from trade and residential premises.
Part 1. Capacities between 50 lb/h and 1,000 lb/h.

3841 Method for the measurement of smoke from manufactured solid fuels for domestic open fires.

3929 Domestic solid fuel ignition pokers and portable undergrate ignition burners for use with commercial butane.

4076 Steel chimneys.

4433 Independent thermostatically controlled central heating boilers with rated outputs up to 44 KW.
Part 1. Boilers with undergrate ash removal, designed to burn solid smokeless fuels.
Part 2. Gravity feed boilers designed to burn small anthracite.

4469 Recommendations for the design and testing of smoke reducing solid fuel burning domestic appliances.

All the above Standards are obtainable direct from the British Standards Institution at British Standards House, 2 Park Street, London, W.1 (individual copies) or Newton House, 101-113, Pentonville Road, London, N.1 (bulk orders). British Standards are revised, when necessary, by the issue either of amendment slips or of revised editions. It is important that users of British Standards should ascertain that they are in possession of the latest amendments or editions

The National Industrial Fuel Efficiency Service

N.I.F.E.S. is a non-profit company which offers industry, local authorities, and commercial property owners practical assistance in the use of heat, energy, and all types of fuel. Instrumented surveys are used to show by precise measurement how systems can be operated efficiently at minimum cost, and regular service is used to establish and maintain maximum efficiency. These services are also used to provide data for the design and specification of new buildings and ancillary services. Advice is also given on methods of increasing the efficiency of steam-raising plant, process plant, furnaces and power plant, and boiler tests can be carried out. Appraisals can be made of space-heating systems and advice given on insulation.

Comprehensive advice and assistance are available in connection with the implementation of the Clean Air Act and with other types of problem, including noise abatement, incineration of waste, and water conservation.

Special training can be provided for boiler plant operators and for personnel whose work is connected with fuel and steam-using plant. For the benefit of those unable to attend technical colleges, N.I.F.E.S. has a specially designed study course leading to the City and Guilds of London Boiler Operator's Certificate.

The Clean Air Case

A Synopsis for the Guidance of Speakers, Writers, Teachers, etc.

1. Historical Background. Growth of the air pollution problem and efforts to abate it, from 1273 to the present day. (*See History table.*)

2. Nature, Sources and Causes, Smoke: Due to incomplete combustion; consists of fine carbonaceous particles and tarry droplets. (For quantities produced, *see Table.*)

Table 2A

Estimates of Air Pollution by Smoke and Sulphur Dioxide from the Main Uses of Fuels in Great Britain in 1938, 1956, and 1967 in Millions of Tons

Estimates prepared by Dr. Albert Parker, C.B.E.

Year	*1938*	*1956*	*1967*
Smoke			
Coal			
Domestic, including miners' coal	1·71	1·26	0·75
Railways	0·26	0·24	0·02
Industrial, etc.	0·74	0·75	0·10
	2·71	2·25	0·87
Sulphur Dioxide			
Coal			
Domestic, including miners' coal	1·21	0·90	0·59
Electricity supply industry	0·40	1·23	1·88
Railways	0·36	0·33	0·02
Collieries	0·32	0·21	0·08
Industrial, etc.	1·33	1·47	0·89
Coke ovens	0·07	0·11	0·08
Gas supply industry	0·14	0·20	0·10
	3·83	4·45	3·64
Coke			
Domestic, including other manufactured solid smokeless fuels	0·06	0·08	0·14
Industrial and miscellaneous	0·18	0·27	0·14
	0·24	0·35	0·28
Oil			
Domestic	—	—	0·01
Industrial(a)	0·05	0·47	1·96
Road and Rail transport	0·01	0·03	0·08
Marine craft (inland)	—	0·03	0·04
	0·06	0·53	2·09
Overall total(b)	4·13	5·33	6·01

(a) The amount of 41·5 million tons of oil used in 1967 for industrial purposes (Table 1) is equivalent in heating value to about 70 million tons of coal, which if used for the same purposes would have produced about 0·2 million tons of smoke, 0·2 million tons of grit and dust and about 2 million tons of sulphur dioxide.

(b) In general over the period 1938 to 1967 the rise in the quantity of sulphur dioxide discharged has been approximately in proportion to the rise in the coal equivalent of the energy consumption; but there has been a decline from 6·43 million tons in 1965 to 6·28 million tons in 1966 and 6·01 million tons in 1967 and in the amount expressed as a percentage of the total coal equivalent. With further increases in the uses of nuclear electricity and of natural gas and decreases in the sulphur content of industrial fuel oils, partly with changes in the sources of the oils, there will be further reductions in the amount of sulphur dioxide discharged into the air. With the decrease in the amount of sulphur dioxide discharged from low domestic chimneys and from railway engines and the move towards higher chimneys for installations burning large quantities of coal and industrial fuel oils, there has been a reduction in the concentration of sulphur dioxide in the air near ground level; this reduction will continue.

Table 2B

Estimates of Pollutants from Road Vehicles in Great Britain in 1967 in Millions of Tons

Consumption of Motor Spirit	12·084 million tons
Consumption of Derv Fuel	4·286 million tons

Pollutant	*Petrol Engines*	*Diesel Engines*
Carbon monoxide	5·7	0·09
Hydrocarbons	0·28	0·017
Aldehydes	0·01	0·003
Oxides of nitrogen	0·19	0·05
Sulphur dioxide	0·02	0·03

The estimated quantity of carbon monoxide discharged into the air from the other industrial and domestic uses of all fuels in 1967 is about 10½ million tons of which nearly five million tons was from domestic heating appliances.

The Cost of Air Pollution

The most recent general inquiry into the cost of air pollution in Britain was made by a sub-committee of the Committee on Air Pollution (the Beaver Committee), the findings of which were included as an appendix in the final report of the Committee in 1954. Members of the Committee have since stated that they consider the estimates to be too conservative.

The main conclusions of the Report were:

(1) The direct costs of pollution to which figures can be put ("however hazardous") are as follows:

	£m. per annum
Laundry	25
Painting and decorating ..	30
Cleaning and depreciation of buildings other than houses ..	20
Corrosion of metals	25
Damage to textiles and other goods	52·5
	152·5

It is considered that these figures are under-estimates, and as certain items have been omitted, it is concluded that the direct costs of air pollution are *of the order of at least £150 million a year.*

(2) The "loss of efficiency". The following figures are given as "a rough guess at possible orders of magnitude": £10m. a year loss to agriculture; £55m. a year loss of working efficiency in manufacturing industry; £60m. a year in other sections, including transport—altogether "the loss of efficiency resulting from pollution might be as great as the direct costs", but to avoid danger of over-estimates a figure of £100m. a year is suggested.

(3) The value of the fuel lost under the conditions which produce smoke is estimated to be £25m. to £50m. a year, but it is considered that this should not be included as one of the costs of pollution.

The total estimated cost is given as £250m. a year, equivalent to £10 per head in the black areas and £5 elsewhere throughout Great Britain, plus the value of the fuel lost.

Guide to Publications

This list of available books, reports and pamphlets on smoke prevention, atmospheric pollution and fuel usage is issued by the National Society for Clean Air as a reference guide for readers. It may also be used for ordering the publications which may be obtained either direct from the Society, or other bookseller. In ordering from the Society please quote the code number preceding each title.

Prices in brackets include postage and packing, which must be included when ordering by post. If a number of items are ordered together excess postages will be refunded. Prices quoted are those current at the date of publication, and are subject to variation.

Information about older, out-of-print, and overseas publications may be obtained from the Society on request. Most of these are in the Society's library and can be consulted, or in some cases borrowed for short periods, by arrangement.

Except where otherwise stated the publisher is the Society. H.M.S.O.—H.M. Stationery Office. The publications are numbered and orders to the Society may be made by the code number.

Legislation

Acts and Memoranda

82. **Clean Air Act, 1956.** The Statute governing smoke, containing sections on dark smoke, smoke from furnaces, grit and dust from furnaces, smoke control areas, smoke nuisances, special cases, clean air council and miscellaneous provisions. (H.M.S.O., 1956) 4 & 5 Eliz. 2 Ch. 52. 2s. (2s. 6d.)

83. **Clean Air Act, 1956.** Memorandum on Smoke Control Areas. (H.M.S.O., 1956) 1s. 3d. (1s. 8d.)

84. **Clean Air Act, 1956.** Memorandum on Miscellaneous Provisions. (H.M.S.O., 1956) 8d. (1s. 1d.)

85. **Amendment to Model Byelaws.** Series IV Buildings (1953) Edition. (H.M.S.O., 1956) 2d. (7d.)

80. **The Clean Air Act, 1956.** A descriptive Summary. (N.S.C.A.) 4s. 6d. per dozen, post free, 6d. single copy.

105. **Thermal Insulation (Industrial Buildings) Act, 1957.** (5 & 6 Eliz. 2 Ch. 40). (H.M.S.O., 1957) 6d. (11d.)

118. **Clean Air Act, 1956. Memorandum on Industrial Provisions.** (H.M.S.O., 1958) 1s. (1s. 5d.)

125. **Clean Air Act, 1956. Memorandum on Miscellaneous Provisions (Scotland).** (H.M.S.O., 1959) 1s. (1s. 6d.)

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197. **Clean Air Act (Northern Ireland), 1964, Belfast.** (H.M.S.O.) 3s. 6d. (3s. 11d.)

262. **Chimney Heights. Second edition of the 1956 Clean Air Act Memorandum.** (H.M.S.O., 1967). 2s. 6d. (3s.)

262(a). **Chimney Height Charts.** The Appendices to the Clean Air Act publication "Chimney Heights" printed on permatrace. (H.M.S.O., 1967) 14s. (14s. 9d.)

264. **Report of the Working Party on Grit and Dust Emission.** (M.H.L.G. Memorandum). (H.M.S.O.) 3s. (3s. 6d.)

278. **Clean Air Act, 1968.** (H.M.S.O., 1968). Eliz. 2 Ch. 62. 2s. (2s. 6d.)

Regulations (Statutory Instruments)

86. **Clean Air: The Smoke Control Areas (Authorized Fuels) Regulations, 1956.** Statutory Instruments, 1956 No. 2023. (H.M.S.O., 1956) 2d. (7d.)

104. **Clean Air Council Order, 1957.** Statutory Instruments No. 766, 1957. (H.M.S.O.) 3d. (8d.)

113. **Smoke Control Areas (Exempted Fireplaces) Order, 1957.** S.I. No. 541, 1957. (H.M.S.O.) 2d. (7d.)

233. **Alkali, etc., Works Order, 1966.** S.I. No. 1143, 1966. (H.M.S.O.) 1s. 6d. (1s. 11d.)

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139. **Smoke Control Areas (Exempted Fireplaces) (Scotland) Order, 1959.** S.I. No. 2264 (S. 123), 1959. (H.M.S.O.) 3d. (8d.)

191. **Clean Air: The Smoke Control Areas (Authorized Fuels) Regulations, 1963.** S.I. No. 1275, 1963. (H.M.S.O., 1963) 3d. (8d.)

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219. **The Smoke Control Areas (Exempted Fireplaces) (Scotland) Order, 1965.** S.I. No. 1284 (S. 57). (H.M.S.O.) 3d. (8d.)

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291. **The Clean Air (Height of Chimneys) (Prescribed Form) Regulations, 1969.** S.I. No. 412. (H.M.S.O.) 1s. (1s. 5d.)

Circulars

124. **Smoke Control Areas.** Circular No. 5/59 (26/1/1959). (H.M.S.O.) 6d. (11d.)

138. **Exempted Fireplaces Order, 1959.** Circular No. 44/59 (16/7/1959). (H.M.S.O.) 3d. (8d.)

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236. **Supplies of Solid Smokeless Fuels.** Circular 25/67 (Ministry of Housing and Local Government) Circular 35/67 (Welsh Office) (30/5/67) 8d. (1s. 1d.)

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292. **Clean Air Act, 1968. I. The Clean Air (Height of Chimneys) (Prescribed Form) Regulations 1969; II. The Clean Air (Height of Chimneys) (Exemption) Regulations, 1969.** Circulars 28/69 (M.H.L.G.), 23/69 (W.O.) 9d. (1s. 2d.)

Other Government Publications

58. **Committee on Air Pollution.** The Interim Report of the Beaver Committee appointed in July, 1953, to examine the nature, causes and effects of air pollution and the efficiency of present preventive measures; to consider what further preventive measure are practicable; and to make recommendations. (Cmnd. 9011). (H.M.S.O., 1953) 3s. 9d. (4s. 3d.)

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284. **Warren Spring Laboratory Report for 1967.** Ministry of Technology, pp. 69. (H.M.S.O.) 9s. 6d. net)

General

13. **Smokeless Air.** The Society's quarterly magazine-type journal. News, articles, photographs, comment. 12s. per annum, post free. 3s. (3s. 6d.)

131. **Air Pollution.** Ed. M. W. Thring. (Butterworths). 42s. (44s.)

15. **Fumifugium or the Smoake of London Dissipated.** John Evelyn. The famous diarist's well-known tract (1661) reprinted by the Society. Special tercentenary issue. Paperback. 2s. 6d. (3s.)

183. **Air Pollution.** Ed. Arthur C. Stern. 1968. Vol. 1: Air Pollution and its Effects. pp. 850. £15 3s. 6d. (£15 8s. 6d.) Vol. 2: Analysis Monitoring and Surveying. £16 6s. 6d. (£16 11s. 6d.)

193. **Smoke Inspector's Handbook** by A. Coe and I. M. Coe, from Clean Air Information Service, The College of Fuel Technology, 90 Talbot Road, London, N.6. Vol. 1: 70s.; Vol. 2: 80s. (post free)

194. **The Control of Air Pollution.** Alan Gilpin. pp. 514. Royal 8vo. London, Butterworths. 130s. (135s.)

210. **Atmospheric Pollution: Its Origins and Prevention.** Meetham, A. R., in collab. with Bottom, D. W. and Cayton, S. 3rd revised edition. pp. 301. Pergamon Press, Oxford. 70s. (73s.)

211. **Clean Air—Law and Practice.** Garner, J. F. and Crow, R. K. pp. 385. Shaw & Sons, London. 63s.

Supplement and Noter Up (the law as on 1 August, 1967). pp. 119. Shaw & Sons, London. 12s. 6d. (13s. 6d.)

212. **Gas Purification Processes.** Ed. by G. Nonhebel. pp. 894. George Newnes, London. £7 (£7 5s.)

229. **Air Pollution.** Smith, A. R. Monograph No. 22, Society of Chemical Industry, 14 Belgrave Square, London, S.W.1. 1966. £3 (£3 1s. 6d.)

Conference Proceedings

(Details of earlier Conference Proceedings available on request)

61. **Glasgow Conference, 1953.** The Des Vœux Memorial Lecture—"Atmospheric Pollution in Relation to Preventive Medicine," and papers on the London Fog Disaster, Smokeless Zones, Production, Use and Availability of Solid Smokeless Fuels and the Efficient and Smokeless Combustion of Fuel Oils. 7s. 6d. (8s. 3d.)

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140. **London, 1959: Diamond Jubilee International Clean Air Conference.** Containing Opening Address by Sir Graham Sutton, F.R.S.; 78 Papers on National Air Pollution Problems, Legislation, Education; Technical Problems; Observations, Investigation and Measurement; Research and International Co-operation; Discussions and Authors' Replies. 30s. (32s. 6d.). (Reprints available of some of the Papers).

144. **Harrogate Conference, 1960.** The Des Vœux Memorial Lecture—"Clean Air, Public Opinion and the Press," Address by Parliamentary Secretary, Ministry of Housing and Local Government, Series of progress reports on (1) Research and Investigation; (2) Domestic Heating; (3) Industrial Problems, Papers on Air Pollution from Road Vehicles, and an Inquiry into the Working of the Clean Air Act. 25s. (26s.)

175. **Brighton Conference, 1961.** Opening Address by John C. George, Parliamentary Secretary, Ministry of Power. Presidential Address by Lord Cohen of Birkenhead. Reports on National Survey of Air Pollution, Furnace Operators Bill, Diesel Smoke; Papers on Industrial Aspects of the Clean Air Act, Whole House Heating, Smoke Control Areas and Transatlantic Discussion. 15s. (15s. 9d.)

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230. **Eastbourne Conference 1965.** Opening Address by John Morris, M.P., Parliamentary Secretary, Ministry of Power. Presidential Address by Sir Alan Wilson, F.R.S. Three Reports on Successes with Smoke Control; two papers on solid fuel distribution and supply problem; air pollution and mortality; odour control; control of pollution from road vehicles; four papers on new horizons in domestic heating; two papers on industrial problems; two papers on unresolved problems in air pollution. 25s. (25s. 9d.)

272. **Blackpool Conference 1967.** Opening Address by Stephen Swingler, M.P., Ministry of State, Ministry of Transport, Presidential Address by Sir John Charrington. Report on Air Pollution from road vehicles; some specific air pollution problems; Clean Air and the North West Environment; two papers on effects of pollution on environment; Des Vœux Memorial lecture—"Clean Air and Future Energy"; a paper on the emission of grit and dust from furnaces; the cost of smoke control; a report on smokeless heating in new housing; industrial and municipal incineration of refuse; paper on new oxygen-fuel process in steelmaking. (Only Pre-prints available) 20s. (20s. 9d.)

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152. **Clean Air, Public Opinion and the Press.** Sir Linton Andrews, 1960. (Advance Proofs only). 9d. (1s. 2d.)

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247. **The Working Party on Air Pollution—European Federation of Chemical Engineering.** D. Gall.

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93. **Ringelmann Smoke Chart** (with instructional leaflet). Chart for measuring smoke density. (Charles Griffin & Co. Ltd.) 1s. 3d. each, 3 for 3s., 6 for 5s., 12 for 9s. including postage.

112. **'Power's' Microringelmann.** Direct facsimile reduction of the standard Ringelmann Chart (McGraw-Hill). Single copies, 2s. 6d. (3s.) 27s. 6d. per dozen, post free.

217. **Sulphur Dioxide.** An Examination of Sulphur Dioxide as an Air Pollutant by the Technical Committee of the Nat. Soc. for Clean Air. 2s. (2s. 5d.)

218. **Clean Air.** Notes for Teachers and Lecturers. Nat. Soc. for Clean Air. 1s. 6d. (2s.)

Clean Air Wall Chart (with Notes for Teachers, as above). From Educational Productions Ltd., 17 Denbigh Street, London, S.W.1. 2s.

288. **Air Pollution from Motor Vehicles.** A Report by the Technical Committee of the Nat. Soc. for Clean Air. 3s. (3s. 5d.)

287. **Clean Air and the Diesel.** Text of an Address given to the East Midlands Division of the Nat. Soc. for Clean Air at Peterborough Oct. 29, 1968. C. J. Hind, Director of Engineering, Perkins Engines Group. (no charge)

Recent Books, Papers and Reports

A selected list

Industrial

104th Annual Report on Alkali etc., Works for 1967. Chief Inspectors. pp. 80. H.M.S.O. 1968. (7s. 6d.).

Industrial Waste Disposal. Edited by Richard D. Ross. 1960. pp. 340. Reinhold, London. (£7 9s. 6d.).

Progress at Scheduled Works. Ireland, F. E. Nat. Soc. for Clean Air Proc. Harrogate Conf. 1968. (Part 1: 25s. Part 2: 15s.).

Emission from Cold Blast Cupolas at Iron Foundries. 1969. H.M.S.O. (2s. 6d. net).

Research and Investigation

Warren Spring Laboratory Report for 1967. Ministry of Technology. pp. 69. H.M.S.O. (9s. 6d. net).

Index to Air Pollution Research, 1968 edition. Burd, Patricia A. Centre for Air Environment, University Park, Pennsylvania 16802. (2 Canadian dollars).

Black Areas and the National Survey of Smoke and Sulphur Dioxide. Clifton, M., Grimoldby, M. R. and Sharp, A. J. Nat. Soc. for Clean Air Proc. Harrogate Conf. 1968. (Part 1: 25s. Part 2: 15s.).

Routine Dust Measurement Methods developed at C.E.R.L. Lucas, D. H. and Snowsill, W. L. Nat. Soc. for Clean Air Proc. Harrogate Conf. 1968. (Part 1: 25s. Part 2: 15s.).

The Monitoring Works of the C.E.G.B. with Special Reference to Techniques and Instrumentation. The Measurement of Sulphur Dioxide. Barber, F. R., Cummings, W. G. and Kingham, E. G. Nat. Soc. for Clean Air Proc. Harrogate Conf. 1968. (Part 1: 25s. Part 2: 15s.).

Measurement of Air Pollutants. Guide to the Selection of Methods. Katz, M. W.H.O. 1969 (H.M.S.O.) (£1 10s. net).

Air Pollution. Report of the Working Party of the European Federation of Chemical Engineering and Directory of Establishments in Europe engaged on Air Pollution Research. Published for the European Federation of Chemical Engineering by The Institution of Chemical Engineers, 16 Belgrave Square, London, S.W.1.

Effects of Air Pollution

Killer Smog. Wise, W. (Publ. Rand McNalty, U.S.A. pp. 183, 5.95 dollars).

Permissible Levels of Occupational Exposure to Airborne Toxic Substances. 6th Report of the Joint I.L.O./W.H.O. Committee on Occupational Health Technical Report Series No. 415. Geneva 1969. (H.M.S.O.) (4s. net).

Road Vehicles

Urban Air Pollution with Particular Reference to Motor Vehicles. Report of a W.H.O. Expert Committee. Technical Report Series No. 410. Geneva 1969. pp. 53. (H.M.S.O.) (6s. net).

Progress Towards the Abatement of Pollution from Petrol Vehicles in Britain. Fosberry, R. A. C. Nat. Soc. for Clean Air Proc. Harrogate Conf. 1968. (Part 1: 25s. Part 2: 15s.).

Clean Air and Electric Vehicles. Barak, M. Nat. Soc. for Clean Air Proc. Harrogate Conf. 1968. (Part 1: 25s. Part 2: 15s.).

Domestic

Practical Problems in the Approach to Smoke Control. Harris, J. Nat. Soc. for Clean Air Proc. Harrogate Conf. 1968. (Part 1: 25s. Part 2: 15s.).

General

The Pollution Reader. Compiled by Anthony de Vos et al. Publ. 1968 by Harvest House, Montreal. pp. 264. (Paper: 3.5 Canadian dollars; cloth: 5.95 Canadian dollars; illustrated).

Air Pollution. Scorer, R. 1968. pp. 151. Pergamon Press, Oxford. (Hard cover 45s.; flexiback 30s. net).

Films and Filmstrips

Following is a list of films and filmstrips on air pollution and its prevention, fuel efficiency, etc. Application for the loan of the films (or purchase of the filmstrips) should be made to the issuing organization, referred to in the list by its initials, the key to which is given at the end of the list. Most of the films are available free. 2-3 weeks advance notice of hire should be given. The running time in minutes is shown. Unless otherwise indicated, the films are available in both 16 and 35 mm. sizes, with sound.

The Society welcomes information on other films suitable for inclusion in future editions of the Year Book.

Films

GENERAL AND EDUCATIONAL

Family Album. The problems of domestic life confronting successive generations of a middle-class family from 1851-1965. 30 mins. G.C.

The First Mile Up. The experience of cities in North America making vigorous efforts to combat air pollution. Smoke prevention in Toronto. Particularly well illustrated. 16 mm. 28 mins. C.F.C.

DOMESTIC AND SMOKE CONTROL AREAS

Window to the Sky. Excellent colour film, showing technique of setting up smoke control area. Suitable for general publicity, and for showing to members of local authorities. 16 mins. G.C. & C.F.L.

Clean Air. Colour film dealing with air pollution and showing how modern methods of domestic heating meet the requirements of the Clean Air Act. 21 mins. S-M & B.P. Ltd. & C.F.L.

French Architecture and Modern Heating. Modern solid fuel heating systems in a wide range of applications to buildings all over France are featured in this colour film which has been adapted in English by the N.C.B. Film Unit. 27 mins. N.C.B.

People Like Us. An amusing colour film about solid fuel home-heating. N.C.B.

Housewarming. "The Bartons" decide to install solid smokeless fuel central heating. 17 mins. N.C.B. (In colour.)

It Takes Your Breath Away. A review of the causes of "dirty air" as produced by domestic and industrial smoke, traffic, etc. The effect on the lungs of living in this type of atmosphere is briefly shown and the film is of value to Public Health Workers as a means of ramming home the ill effects of a smoky atmosphere. 16 mm. 10 mins. B.M.A.

Gas in Modern Housing. Stresses the need to incorporate clean air principles in new house design. 16mm. 18 mins. G.C.

Project—Halton Fields. Features a modern housing estate where developers have used domestic oil fired central heating on a district level. Colour. 20 mins. S-M & B.P.

Group Heating in Paisley. District Heating claims great advantages over the more conventional domestic heating particularly in new development areas as shown in this study of urban renewal in Paisley. Colour. 7 mins. N.C.B.

Leicester District Heating. Similar theme to the above but a more ambitious and extensive project. Colour. 10 mins. N.C.B.

Welcome Home. The case histories of three householders in newly created smokeless zones in Sheffield. The range of solid smokeless fuels and heating appliances available is fully covered. Colour. 26 mins. N.C.B.

VEHICLE POLLUTION

You and Your Diesel. The importance of maintenance for diesel-engined lorries and tractors. In colour. 35 mins. S-M. & B.P. Ltd.

Horsepower and Hydrocarbons. The California Motor Vehicle Control Board explain the nature and extent of emission problems from the motor car in this film. The alternatives to the petrol driven car are examined, as are methods of reducing levels of emission. The first film to approach all aspects of the problem fully. Colour. 22 mins. 16 mm.

FUEL, POWER AND INDUSTRIAL

No Tipping. Illustrates a new and revolutionary approach to refuse disposal and shows the threat to clean air posed by traditional methods of refuse disposal. Colour. 14 mins. 16 mm. M.B.T.

Incineration—The Burning Question. Shows another method of refuse disposal and pinpoints the national problem of 17,000,000 tons of refuse needing to be disposed of annually. Colour. 30 mins. J.T.

Fluidized Coal Carbonization and Hot Briquetting. To provide sufficient smokeless fuels to meet the increasing demand, the N.C.B. Coal Research Establishment has developed a new smokeless fuel. 12 mins. N.C.B.

Homefire. Smokeless fuel for the open fire. Based on small-sized smoky coal the new smokeless fuel is now in quantity production at Birch Coppice. The manufacture of the briquettes is explained non-technically. 12 mins. N.C.B. (In colour.)

Using the Coal. Shows various uses of coal, and its place among modern sources of energy. 37 mins. 16 mm. only. N.C.B.

Mechanical Firing of Coal. A group of six colour films presenting the main types of mechanical stoker. Total length 60 mins. N.C.B.

Coal: Our Wasting Asset. This film deals with fuel efficiency, fuel conservation and the problem of smoke. 10 mins. N.C.B.

Saharan Venture. Methane gas from the Sahara is helping to provide Britain with abundant supplies of clean fuel. This film tells the story of the venture in colour. 28 mins. G.C.

The Methane Story. A longer version of the above film made for the benefit of specialists. Emphasizes the methods and techniques employed. Colour, 16 mm. 45 mins. G.C.

Clearing the Air. In many districts much more remains to be done if the Act is to be effective. This film shows the contribution of the Gas Industry to progress. Colour. 12 mins. G.C.

Power in Trust. Electricity plays an important role in all our lives. Through the eyes of a schoolboy the generation of electricity in a modern power station is explained. Colour, 15 minutes. M.R., C.E.G.B.

Atomization. Discusses the technical aspects of combustion of oil fuels. 17 mins. S-M & B.P. Ltd.

Combustion and the Chain Grate Stoker. Shows chemical and physical principles of coal, combustion, and their application in chain grate stoker. 25 mins. B. & W.

Pulverized Fuel. Deals with principles of pulverized fuel use. 40 mins. B. & W.

This Age of Steam. The film emphasizes the growth of world population, rising industrialization and improving standards of living, which result in a rapidly increasing demand for power, chiefly electrical power. Colour. 35 mins. B. & W.

Industrial Electric Heating. Colour film on the use of electricity for industrial heating processes. 30 mins. E.C.

Combustion. An instructional film for service engineers and boilerhouse staff. 30 mins. H.B.

Steam and Steam Generation. Film deals with the properties of steam, early boiler design and the modern steam generator design. Colour. 16 mm. Sound. 31 mins. (International Combustion Ltd.) C.F.L.

Running the Low Ram Stoker. Shows the operational technique for the Low Ram Cooking Stoker. 16 mm. 25 mins. H.B.

Synchromatic. Deals with a new revolutionary under feed stoker showing the working in detail. Colour. 16mm. 8 mins. H.B.

Gas Flow. Research into the effects of various types of flue baffles and bridge heights. 16 mm. 7 mins. H.B.

Air Flow. Experiments on the hydraulic flow model applied to the Chain Grate stoker. 16 mm. 9 mins. H.B.

The Properties of Coal. Explains difference between various coal gradings. Explanation of swelling number. 16 mm. 18 mins. H.B.

Sea Born Treasure. The purpose of this film is to touch upon the connection between the discovery of gas in the North Sea and the effect its distribution may be expected to have on the national economy and the citizen. 16 mm. Colour, 25 mins. G.C.

Key to Issuing Organizations:

B.M.A.—British Medical Association, Film Library, Tavistock Square, London, W.C.1.
B. & W.—Babcock & Wilcox Ltd., Babcock House, 209 Euston Road, London, N.W.1.
†C.F.C.—Concord Films Council, Nacton, Ipswich, Suffolk.
C.F.L.—Central Film Library, Government Buildings, Bromyard Avenue, Acton, London, W.3.
E.C.—The Electricity Council, Marketing Department, Trafalgar Buildings, 1 Charing Cross, London, S.W.1.
G.C.—The Gas Council, 6-7 Great Chapel Street, London, W.1.
*H.B.—Hodgkinson Bennis Ltd., Little Hulton, Worsley, Manchester.
J.T.—John Thompson Ltd., Ettingshall, Wolverhampton.
M.B.T.—Motherwell Bridge Tacol Ltd., Green Dragon House, 64-70 High Street, Croydon, Surrey.
M.R., C.E.G.B.—Public Relations, Midlands Region, C.E.G.B., Haslucks Green Road, Shirley, Solihull, Warwickshire.
N.C.B.—National Coal Board, Film Branch, 26-28 Dorset Square, London, N.W.1.
S-M & B.P. Ltd.—Shell-Mex and B.P. Film Library, 25 The Burroughs, Hendon, London, N.W.4.

†Hire Charge of £1 10s. per film.
*Hire Charge of £1 per film.

Film Strips

Air Pollution and You. Colour. Traces sources of air pollution and illustrates methods of control in 31 captioned frames. (Produced by Current Affairs Films of New York.) Available, *on loan*, from the Society free of charge to Members. A charge of 3s. 6d. for postage and packing will be made to non-members.

Air Pollution. Black and white. Prepared in consultation with Association of Public Health Inspectors. General survey of problem, methods of measurement, etc. (prepared by Camera Talks). Available from Society, complete with lecture notes, price 2 guineas. (Quote Ref. No. CT.58). Also **The Public Health Inspector.** Colour. £2 12s. 6d. (Quote Ref. No. CT.24).

The Role of Industry. Colour. Deals with the general problem, illustrates plant and appliances for preventing smoke and grit. (Prepared by Camera Talks in conjunction with Association of Public Health Inspectors). Available from Society, complete with lecture notes, £2 12s. 6d.

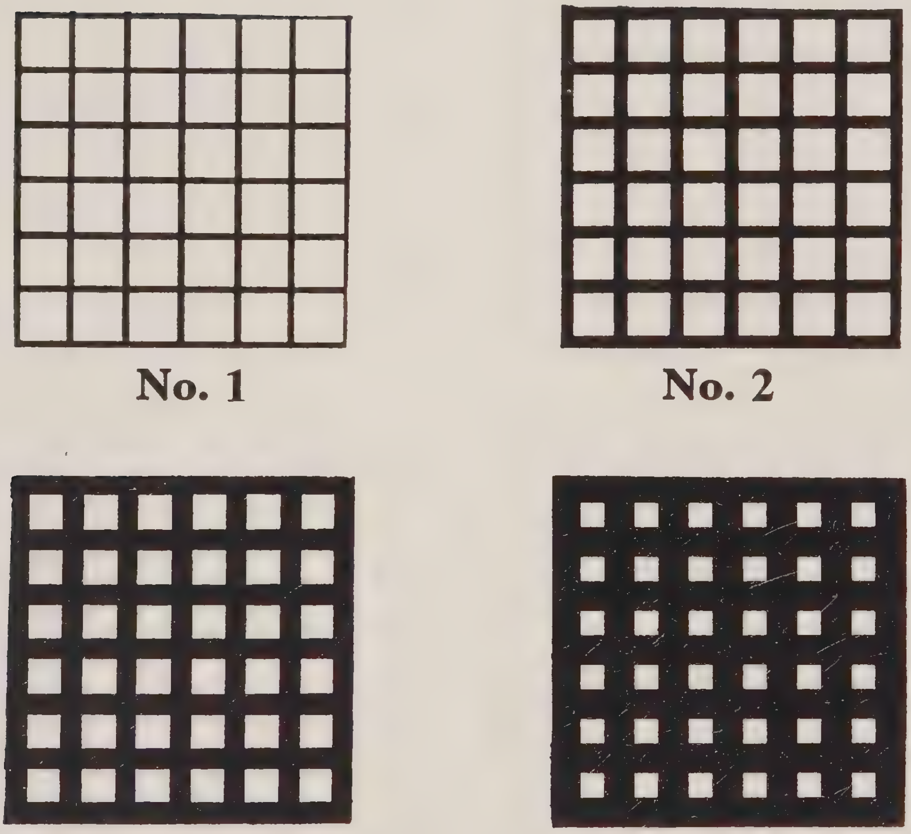
Smoke Control Areas. Colour. Deals with setting up of smoke control areas. Suitable for general public, officers and members of local authorities. (Prepared by Camera Talks in conjunction with Association of Public Health Inspectors). Available from Society, complete with lecture notes, £2 12s. 6d.

Air Pollution. (A) Its nature, production and effects, and (B) its dispersion and accumulation. Two film strips in colour, each containing 32 frames. Script by R. S. Scorer, PH.D. Foreword by Sir Hugh Beaver. (Prepared by Diana Wyllie Ltd.). Available from Society, price £4 the pair. (Quote Ref. No. DW.F.22/23).

Chronic Bronchitis. Colour. Shows effects of Air Pollution in causation of Bronchitis. Lecture notes by Dr. J. L. Burn, with Appendix on Air Pollution. (Diana Wyllie Ltd., in co-operation with Pfizer Ltd.). Available from the Society, price £2.

Good-Bye Smog. An illustrated talk using a series of 2 in. x 2 in. slides; covers all aspects of the Clean Air Act and gives valuable advice on fuels, grants and appliances. Inquiries to:- The Women's Advisory Council on Solid Fuel, 18 South Molton Street, London, W.1.

The Ringelmann Chart



No. 1

No. 2

No. 3

No. 4

The Ringelmann chart, by means of which dark smoke is defined in the Clean Air Act, consists of the above four shades, which when viewed from a sufficient distance appear as varying tones of grey. They show 20, 40, 60, and 80 per cent blackness. The charts are 4 in. square, and are viewed, in line with the smoke being observed, at about 50 ft. from the observer. A full specification for production and use is given in B.S. 2742C. The standard chart is published in Britain by Charles Griffin & Co. Ltd., 42 Drury Lane, London, W.C.2. A pocket-size facsimile the "Microringelmann" is published by the U.S. journal "Power" (McGraw-Hill). Copies of both charts may be purchased from the Society. (See Guide to Publications, following, for prices.)

The History of Air Pollution in Great Britain

A Chronological Table

1273	Use of coal prohibited in London as being "prejudicial to health".
1306	Royal Proclamation prohibiting artificers from using sea-coal in their furnaces. Record of the execution of one offender.
1307	Commission of Inquiry appointed to "inquire of all such who burnt sea-coal in the city or parts adjoining, and to punish them for the first offence with great fines and ransoms, and upon the second offence to demolish their furnaces".
1578	Queen Elizabeth I "findeth hersealfe greately greved and anoyed with the taste and smoke of the sea-cooles".
1648	Petition of Londoners to Parliament to prohibit the importation of coal from Newcastle on account of the injury they experienced.
1661	John Evelyn submitted his "Fumifugium, or the Smoake of London Dissipated", to Charles II.
1819	Committee appointed by Parliament to inquire how far persons using steam engines and furnaces could erect them in a manner less prejudicial to public health and comfort.
1843	A Select Committee recommended the introduction of a Bill dealing with nuisances from furnaces and steam engines.
1845	Another Select Committee reported that it was not desirable to extend the provisions of an Act beyond furnaces used for steam generation.
1847	The Town Improvement Clauses Act contained a section dealing with factory smoke.
1853-6	Smoke Abatement Acts relating to the Metropolitan area.
1866	The Sanitary Act empowered sanitary authorities to take action in cases of smoke nuisances.
1875	The Public Health Act containing a smoke abatement section on which legislation to the present day has been based.
1881	Smoke Abatement Exhibition at South Kensington organized by the Public Health and Kyrle Societies.
1882	Formation of the National Smoke Abatement Institution.
1891	The Public Health (London) Act.
1899	Formation of the Coal Smoke Abatement Society, led by Sir William Richmond, R.A. and Dr. H. A. Des Vœux (concerned mainly with London).
1909	Sheffield Smoke Abatement Exhibition, at which was set up the Smoke Abatement League of Great Britain (mainly for the provinces and centred later in Manchester and Glasgow).
1912	International Smoke Abatement Exhibition in London, organized by the Coal Smoke Abatement Society, leading to the formation of a Committee for the Investigation of Atmospheric Pollution.
1913	Smoke Abatement Bill introduced in the House of Commons by A. G. C. Harvey, M.P.
1914	Smoke Abatement Bill introduced in the House of Lords by Lord Newton. Withdrawn on the appointment of a Departmental Committee to investigate the problem.
1920	Committee re-formed after the war with Lord Newton as Chairman.
1921	Publication of the Final Report of the Newton Committee.
1926	Public Health (Smoke Abatement) Act by which the 1875 and 1891 Acts were amended and extended.
1927	Establishment of first regional committees of local authorities.
1929	Amalgamation of the Coal Smoke Abatement Society and Smoke Abatement League of Great Britain to form the National Smoke Abatement Society. First publication of a journal (now *Smokeless Air*) devoted to air pollution.
1936	Public Health Act, in which were included the provisions of the Smoke Abatement Act of 1926.

1946 Simon Report on Domestic Fuel Policy, recommending, *inter alia*, measures for domestic smoke prevention.

1946 First smokeless zone and prior approval legislation (Manchester Corporation Act).

1951 First smokeless zone established (in Coventry).

1952 Ridley Report on "Policy for the Use of Fuel and Power Resources", recommending, *inter alia*, measures for smoke prevention.

1952 London smog disaster, the most serious for many years, with a death roll of 4,000 (*q.v.*).

1953 Beaver Committee on Air Pollution set up by the Government and published an Interim Report.

1954 Final Report of the Beaver Committee.

1954 A Clean Air Bill introduced by Gerald Nabarro, M.P., and withdrawn (4 February, 1955) on Government undertaking to introduce their own Bill.

1955 Whole of City of London declared a smokeless zone.

1956 Clean Air Act.

1958 National Smoke Abatement Society became incorporated under new name of National Society for Clean Air.

1959 International Diamond Jubilee Clean Air Conference and Exhibition (N.S.C.A.), London.

1962 Smog episode in London and other cities. Estimated death roll of 750 in Greater London.

1962 Holborn M.B. first local authority in country to reach its final target under Clean Air Act.

1964 Amendments to Clean Air Act in Housing Act, 1964, modifying smoke control area policy. Clean Air Act (Northern Ireland).

1966 First Congress of the new International Union of Air Pollution Prevention Associations (in London).

1968 Clean Air Act.

Smoke Control Areas

Programmes and Progress

The following lists contain the names of Local Authorities in the "Black Areas" with (1) the target date for completion of their Smoke Control Programme, (2) the final acreage, (3) acreage in operation on 1 April, 1969, (4) total number of premises in operation on 1 April, 1969.

The figures have been compiled as accurately as possible from the records of the Ministry of Housing and Local Government, from "Smoke Control 1962-1966" and from information received directly from some Local Authorities in reply to the Society's request for figures on their smoke control programmes. Where no figures are given in columns 1 and 2, this means that the Authority in question has not submitted a programme to the Minister of Housing and Local Government.

The figures in italics refer to acres and premises in smokeless zones established by some Local Authorities before the Clean Air Act and in areas where smoke control operates through tenancy agreements.

Bold type indicates completed programmes.

NORTHERN

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.) 1.4.69*	*4* *Premises (In Oper.) 1.4.69*
Tyneside and Wearside				
Gateshead C.B.	1980	4,677	475	3,410
Newcastle C.B.	1980	11,401	4,556	19,205
South Shields C.B.	1980	—	96	1,725
Sunderland C.B.	1980	9,013	1,440	20,313
Tynemouth C.B.	1987	5,000	650	2,973
Jarrow B.	1975	1,500	172	1,522
Wallsend B.	1975	3,544	1,173	4,069
Blaydon U.D.	—	—	291	735
Boldon U.D.	1977	—	205	2,012
Felling U.D.	1976	—	545	3,115
Gosforth U.D.	1970	—	—	—
Hebburn U.D.	1974	1,563	1,166	3,386
Longbenton U.D.	—	—	539	6,486
Newburn U.D.	1980	4,648	630	2,940
Ryton U.D.	—	—	—	—
Whickham U.D.	1977	6,213	827	3,606
Teeside				
Darlington C.B.	—	—	151	1,572
Hartlepool C.B.	1978	11,280	2,530	8,495
Teeside C.B.	—	49,107	7,636	30,389
YORKSHIRE				
West Riding (North)				
Bradford C.B.	1971/2	25,503	13,479	49,269
			1,481	*14,284*
Dewsbury C.B.	1975	6,720	3,747	8,027
Halifax C.B.	1977	14,081	2,595	14,882
Huddersfield C.B.	1980	14,147	3,391	12,448
Leeds C.B.	1975	40,613	14,597	51,926

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.) 1.4.69*	*4* *Premises (In Oper.) 1.4.69*
West Riding (North) (continued)				
Wakefield C.B.	1977	5,800	1,931	4,550
Batley B.	1977	4,461	968	2,852
Brighouse B.	1975	7,875	2,498	5,812
Castleford B.	—	—	34	507
Keighley B.	1970	3,238	4,222	12,648
Morley B.	1977	9,994	3,961	4,900
Ossett B.	**1968**	**3,332**	**3,332**	**5,634**
Pontefract B.	1982	4,865	987	1,991
Pudsey B.	1980	5,205	1,715	3,096
Spenborough B.	1972/3	8,600	2,864	7,629
Aireborough U.D.	1970	6,856	4,370	7,930
Baildon U.D.	1970	2,830	2,382	4,227
Bingley U.D.	1970	11,018	4,309	7,936
Denholme U.D.	—	—	—	—
Elland U.D.	1974	5,951	857	1,334
Featherstone U.D.	—	—	—	—
Heckmondwike U.D.	1972	697	454	1,734
Horbury U.D.	1971	1,280	566	2,219
Horsforth U.D.	1970	2,706	1,400	4,863
Knottingley U.D.	1969	2,837	678	3,002
Mirfield U.D.	1979	—	715	2,167
Normanton U.D.	1979	3,061	56	152
Queensbury and Shelf U.D.	1975	2,795	615	1,483
Rothwell U.D.	1974	10,695	2,498	24,182
Shipley U.D.	1970	2,184	1,934	9,339
Sowerby Bridge U.D.	1973	4,000	696	2,675
Stanley U.D.	—	5,169	1,308	664
West Riding (South)				
Barnsley C.B.	—	7,811	676	1,060
Doncaster C.B.	1975	8,371	2,612	9,567
Rotherham C.B.	1973	8,000	1,699	7,675
Sheffield C.B.	1972	39,598	19,925	85,339
Conisborough U.D.	1983	—	17	178
Cudworth U.D.	1975	1,746	—	—
Darfield U.D.	—	—	—	—
Darton U.D.	1972	4,718	512	569
Dearne U.D.	1987	—	210	1,283
Dodworth U.D.	—	—	—	—
Hoyland Nether U.D.	—	—	—	—
Mexborough U.D.	1975	—	236	227
Rawmarsh U.D.	—	—	—	—
Royston U.D.	—	—	—	—
Swinton U.D.	1980	—	153	1,326
Wath-upon-Dearne U.D.	1972	2,665	823	1,443
Wombwell U.D.	—	—	106	388
Worsborough U.D.	1976	1,660	—	—
Rotherham R.D.	—	—	—	—
East Riding				
Kingston-upon-Hull C.B.	1971	12,000	4,848	27,682

NORTH WESTERN

South Lancashire and North-East Cheshire

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.) 1.4.69*	*4* *Premises (In Oper.) 1.4.69*
Bolton C.B.	1972	5,401	2,080	16,674
			86	*1,050*
Bury C.B.	1971	2,168	1,335	4,899
Manchester C.B.	1970	27,255	12,615	75,665
			523	*4,764*
Oldham C.B.	1981	6,392	2,350	11,101
Rochdale C.B.	1972	9,556	5,974	19,724
			67	*337*
Salford C.B.	1970	5,202	2,623	22,877
			57	*1,859*
Stockport C.B.	1975	8,439	1,383	11,338
Wigan C.B.	1975	5,083	1,320	4,055
Altrincham B.	1973	3,519	506	2,071
Ashton-under-Lyne B.	1976	4,146	1,705	6,754
Dukinfield B.	—	1,725	1,326	1,900
Eccles B.	1970	3,417	2,323	5,938
Farnworth B.	1978	1,504	437	1,145
Heywood B.	1970	8,342	3,297	7,822
Hyde B.	1975	4,170	2,231	8,438
Leigh B.	1971	6,359	792	4,930
Middleton B.	1981	5,170	2,230	8,486
Mossley B.	1970	1,200	54	541
Prestwich B.	—	2,420	2,539	4,067
Radcliffe B.	—	4,915	527	1,374
Sale B.	1972	3,628	2,717	12,719
Stalybridge B.	1975	3,030	1,365	3,270
Stretford B.	1970	3,530	2,053	13,323
Swinton and Pendlebury B.	1978	3,363	1,019	5,270
Abram U.D.	—	—	—	—
Aspull U.D.	—	—	—	—
Atherton U.D.	1974	2,289	1,517	2,854
Audenshaw U.D.	1973	1,241	659	1,047
Blackrod U.D.	—	—	—	—
Bredbury and Romily U.D.	1977	688	566	2,126
Chadderton U.D.	1969	3,013	2,602	10,356
Cheadle and Gatley U.D.	**1968**	**5,299**	**5,299**	**20,389**
Crompton U.D.	1975	2,865	458	1,757
Denton U.D.	1969	2,592	2,149	12,778
Droylsden U.D.	1974	1,245	893	5,248
Failsworth U.D.	1975	1,663	1,087	4,140
Golborne U.D.	1975	5,765	202	394
Hindley U.D.	1979	2,612	225	999
Horwich U.D.	—	—	—	—
Ince-in-Makerfield U.D.	—	—	—	—
Irlam U.D.	1974	4,717	748	2,541
Kearsley U.D.	1980	1,720	11	84
Lees U.D.	—	—	—	—
Little Lever U.D.	—	808	—	—
Royton U.D.	1973	2,149	950	2,183
Tottington U.D.	—	2,544	128	589
Tyldesley U.D.	1980	5,174	623	500
Urmston U.D.	1972	3,944	1,659	7,268
Westhoughton U.D.	1980	5,834	183	861

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.) 1.4.69*	4 *Premises (In Oper.) 1.4.69*
South Lancashire and North-East Cheshire (continued)				
Whitefield U.D.	**1968**	**3,386**	**3,386**	**5,404**
Worsley U.D.	1973	7,240	1,881	6,573
Central Lancashire				
Blackburn C.B.	1978	8,088	929	7,792
Burnley C.B.	1971	4,695	1,908	15,175
Preston C.B.	1975	6,357	2,141	15,807
			176	*1,918*
Accrington B.	1975/80	4,418	339	1,878
Colne B.	1976	817	427	2,983
Darwen B.	1980	—	618	1,739
Nelson B.	1972	—	432	3,892
Barrowford U.D.	1975	—	324	211
Brierfield U.D.	1974	—	85	518
Church U.D.	1980	528	226	997
Clayton-le-Moors U.D.	—	1,060	—	—
Fulwood U.D.	1977	3,164	469	735
Great Harwood U.D.	1975	—	—	—
Oswaldtwistle U.D.	—	—	—	—
Padiham U.D.	1973	976	549	1,954
Rishton U.D.	1987	1,087	62	174
Merseyside				
Birkenhead C.B.	1979	8,043	3,314	8,788
Bootle C.B.	1975	3,330	1,081	6,281
Liverpool C.B.	1972	27,818	13,293	68,738
St. Helens C.B.	1975	8,865	1,699	4,293
Wallasey C.B.	—	5,961	5,178	22,940
Warrington C.B.	1972	4,639	2,462	11,467
Bebington B.	1980	2,220	1,026	6,605
Ellesmere Port B.	1977	3,724	1,565	7,790
Widnes B.	1975	4,500	2,478	6,161
Ashton-in-Makerfield U.D.	—	—	—	—
Haydock U.D.	—	—	—	—
Huyton-with-Roby U.D.	1970	3,054	953	3,645
Kirkby U.D.	—	—	1,947	10,938
Litherland U.D.	—	1,180	326	215
Newton-le-Willows U.D.	1978	2,800	152	1,068
Prescot U.D.	1976	748	124	1,152
Runcorn U.D.	1975	8,000	1,117	3,705
MIDLANDS				
Derby, Nottingham and Chesterfield				
Derby C.B.	1979	18,000	1,800	12,000
Nottingham C.B.	1975	18,364	6,850	22,810
			125	*2,000*
Chesterfield B.	1975	8,472	1,202	4,943
Ilkeston B.	1980	3,017	552	1,910
Mansfield B.	1980	7,009	955	2,229

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.) 1.4.69*	4 *Premises (In Oper.) 1.4.69*
Derby, Nottingham and Chesterfield (continued)				
Alfreton U.D.	—	5,023	175	465
Arnold U.D.	1981	—	86	377
Beeston and Stapleford U.D. ..	1974	6,468	4,645	12,897
Bolsover U.D.	—	4,326	86	167
Carlton U.D.	1975	4,018	173	1,257
Dronfield U.D.	1975	4,567	868	4,288
Eastwood U.D.	—	—	—	—
Hucknall U.D.	—	4,029	474	421
Kirby-in-Ashfield U.D.	—	—	—	—
Long Eaton U.D.	1980	3,559	37	407
			57	*750*
Mansfield Woodhouse U.D. ..	1988	—	880	572
Staveley U.D.	1976	6,504	252	838
Sutton-in-Ashfield U.D.	1982	—	954	2,721
West Bridgford U.D.	—	3,045	—	—
Basford R.D.	—	—	—	—
Chesterfield R.D.	1972	29,000	5,239	11,161
North Midlands				
Leicester C.B.	1975	16,990	9,561	43,519
West Midlands				
Birmingham C.B.	1974	51,147	8,249	58,374
			203	*1,387*
Coventry C.B.	—	19,171	5,493	20,088
			30	*232*
Dudley C.B.	1980	13,151	5,289	24,356
Walsall C.B.	1980	8,777	1,285	3,122
Warley C.B.	1989	9,471	812	6,609
West Bromwich C.B.	1987	10,298	1,245	13,304
Wolverhampton C.B.	1986	—	4,104	17,250
Halesowen B.	1971	5,247	2,455	7,191
Nuneaton B.	1978	11,767	2,945	4,531
Solihull B.	1989	13,645	3,600	7,436
Stourbridge B.	1975	4,000	1,271	5,294
Sutton Coldfield B.	1979	13,978	1,459	5,484
Aldridge-Brownhills U.D. ..	—	9,284	1,863	9,396
Bedworth U.D.	—	—	1,224	2,009
Coseley U.D.	—	—	—	—
Darlaston U.D.	—	—	52	512
Willenhall U.D.	1972	2,834	417	3,049
Potteries				
Stoke-on-Trent C.B.	1975	21,209	6,938	13,800
Newcastle-under-Lyne B.. ..	1980	8,882	3,024	8,396
Kidsgrove U.D.	1979/80	4,095	111	1,152
SOUTH WEST				
Bristol				
Bristol C.B.	1980	26,345	5,051	18,105

LONDON

	1 Target Date	2 Final Acreage	3 Acreage (In Oper.) 1.4.69	4 Premises (In Oper.) 1.4.69
Greater London Boroughs				
City of London	**1955**	**677**	**677**	**21,700**
Barking	—	8,449	5,616	41,728
Barnet	1976	22,123	10,103	58,478
Bexley	1975	14,986	6,334	15,225
Brent	1971	10,924	6,296	46,503
Bromley	1977	39,293	7,327	38,757
Camden	**1968**	**5,364**	**5,364**	**85,862**
Croydon	1975	23,812	4,581	39,521
Ealing	1971	13,708	9,469	73,282
Enfield	1970	20,060	14,404	58,001
Greenwich	1970	11,724	8,166	56,588
Hackney	**1967**	**4,812**	**4,812**	**90,507**
Hammersmith	**1967**	**3,988**	**3,988**	**72,559**
Haringey	**1968**	**7,484**	**7,484**	**94,789**
Harrow	1975	12,555	4,035	28,536
Havering	1974	29,110	9,868	41,752
Hillingdon	1976	27,259	11,378	32,166
Hounslow	1970	14,469	9,907	40,467
Islington	1969	3,679	3,096	81,678
Kensington and Chelsea (Royal)	1971	2,952	2,279	59,661
Kingston-upon-Thames (Royal)	1978	9,279	3,198	18,416
Lambeth	1976	6,738	2,834	52,338
Lewisham	1970	8,579	8,182	84,500
Merton	1975	9,379	5,353	28,788
Newham	1978	8,986	1,670	16,072
Redbridge	1970	13,947	10,347	56,449
Richmond-upon-Thames	1970	13,645	11,619	52,104
Southwark	1975	7,117	4,186	57,618
Sutton	1975	10,729	3,799	26,060
Tower Hamlets	**1968**	**4,994**	**4,994**	**78,702**
Waltham Forest	1975	9,804	5,996	40,717
Wandsworth	1970	8,628	5,018	47,045
Westminster (City)	1970	5,334	5,142	117,262
Outer London				
Dartford	—	—	1,796	5,178
Epsom and Ewell	—	—	—	—

Local Authorities Outside the Black Areas

Local Authorities outside the Black Areas who have Smoke Control Areas in operation, with total acreages and premises to 1.4.69

	Acreage	Premises
Aylesbury B.	275	535
Basildon U.D.	3,228	19,587
Bedford B.	1,752	6,639
Blaby R.D.	572	2,246
Blackburn R.D.	260	413
Brentwood U.D.	219	2,799
Burton-on-Trent C.B.	180	1,548
Cambridge B.	411	1,453
Chatham B.	2,805	6,109
Cheltenham B.	1,006	1,821
Cheshunt U.D.	793	5,360
Corby U.D.	441	3,566
Crawley U.D.	3,679	11,198
Crewe B.	702	3,785
Darlington R.D.	503	3,669
Elstree R.D.	500	2,877
Exeter C.B.	3,652	7,728
Gillingham B.	4,053	9,168
Glanford Brigg R.D.	1,526	1,860
Glossop B.	365	1,911
Gloucester C.B.	85	672
Grantham B.	1,110	3,468
Gravesend B.	686	1,381
Hale U.D.	28	470
Harlow U.D.	5,889	17,291

	Acreage	Premises
Hazel Grove and Bramhall U.D.	974	4,156
Heanor U.D.	40	7
Hemel Hempstead B.	2,672	6,462
High Wycombe B.	2,414	7,727
King's Lynn B.	208	2,300
Kingswood U.D.	12	130
Lancaster B.	3,389	5,114
Leamington Spa B.	841	2,414
Leek U.D.	96	18
Letchworth U.D.	1,103	3,611
Lincoln C.B.	1,389	1,589
Luton C.B.	2,306	14,637
Marple U.D.	69	405
Meriden R.D.	2,188	19,215
Northfleet U.D.	393	1,317
Old Fletton U.D.	149	1,301
Oxford C.B.	1,655	5,246
Peterborough B.	354	1,924
Potters Bar U.D.	730	1,669
Ramsbottom U.D.	205	780
Reading C.B.	1,859	8,067
Rochester B.	2,693	10,689
Rugby B.	1,688	4,110
Runcorn R.D.	23	170
Saddleworth U.D.	227	413
Scunthorpe B.	2,791	8,200
Seaton Valley U.D.	1,960	396

	Acreage	Premises
Seisdon R.D.	57	24
Shrewsbury B.	379	582
Skelmersdale U.D.	1,531	481
Skipton U.D.	1,335	2,656
Slough B.	2,953	13,245
Southampton C.B.	857	5,099
South East Derbyshire R.D.	28	288
Southport C.B.	67	250
Staines U.D.	6,504	11,180
Stanley (Co. Durham) U.D.	880	100
Stokesley R.D.	510	2,014
Tamworth B.	180	17
Thurrock U.D.	4,041	10,733
Todmorden B.	426	3,809
Waltham Holy Cross U.D.	299	3,050
Warwick B.	147	1,241
Watford B.	1,357	5,284
Wellington U.D.	232	11
Wetherby R.D.	157	670
Whiston R.D.	383	4,438
Whitley Bay B.	1,521	3,570
Wilmslow U.D.	293	2,139
Winsford U.D.	608	4,417
Wortley R.D.	460	1,368

SCOTLAND

Total Acreage and Premises in Operation at 1.4.69

	Acreage	Premises
Alloa	272	1,068
Barrhead	619	3,734
Clackmannan County	370	1,535
Clydebank	1,454	6,641
Coatbridge	2,515	9,717
Denny and Dunipace	113	316
Dumbarton Burgh	1,244	5,112
Dundee	5,188	30,794
East Kilbride	**4,714**	**17,668**
Edinburgh	7,086	26,339
Falkirk	2,729	5,123
Fife County	300	2,877
Galashiels	690	1,611
Glasgow	20,491	145,425

	Acreage	Premises
Grangemouth	674	3,189
Hamilton	212	2,260
Kilmarnock	77	293
Lanark County	1,328	7,346
Midlothian County	1,070	1,825
Milngavie	281	24
Motherwell	759	4,952
Paisley	3,775	15,793
Port Glasgow	712	3,219
Renfrew Burgh	1,043	3,418
Rutherglen	639	4,511
Stirling County	3,662	7,648
West Lothian	2,384	15

WALES

Total Acreage and Premises in Operation at 1.4.69

	Acreage	Premises
Connah's Quay U.D.	53	—
Mold U.D. (Nos. 1 & 2)	137	381
Newport C.B.	43	651
Wrexham U.D. (Nos. 1 & 2)	277	1,375

	Acreage	Premises
Pontypridd	8,141	12,717

(By arrangement, only low volatile coal to be sold in the area)

NORTHERN IRELAND

Total Acreage and Premises in Operation at 1.4.69

	Acreage	*Premises*		*Acreage*	*Premises*
Antrim R.D.	72	—	Holywood U.D. (Nos. 1 & 2)	59	—
Belfast C.B. No. 1	285	1,760	Lurgan B.C. No. 1	209	—
Castlereagh R.D. (Nos. 1 & 2)	689	1,963	Newtownabbey U.D. (Nos. 1 & 2)	284	—
Craigavon U.D.	3,580	478	Portadown B.C. (Nos. 1 & 2)	103	128
Hillsborough R.D. No. 1	338	461			

Smoke Control Position in Regions of England

at 31 March, 1969

(Figures Supplied by Ministry of Housing and Local Government)

(1) *Region*	(2) *No. of black area acres covered by smoke control orders confirmed or awaiting decision*	(3) *Percentage* of total black area acreage in region so covered*	(4) *No. of black area premises covered by smoke control orders confirmed or awaiting decision*	(5) *Percentage* of total black area premises in the region*
Northern	26,516	21·16	128,710	23·28
Yorkshire and Humberside	157,782	41·90	523,966	44·86
East Midlands	51,848	19·32	161,987	31·65
Greater London	219,698	67·18	1,956,437	74·12
North Western	162,139	40·41	711,608	41·79
West Midlands	76,616	30·77	338,505	32·19
South Western	7,201	27·33	26,650	17·89
Total (black areas)	701,800	39·56	3,847,863	49·49
Outside black areas (all parts)	129,126		422,183	
GRAND TOTALS	830,926		4,270,046	

*The percentage shown in columns (3) and (5) above are percentages of the *total* acreage and of the *total* number of premises in the black areas concerned. In practice it may not always be necessary for the whole of the black area authority's district to be covered by smoke control orders (e.g. there may be some areas of open country).

Note:

Statistics in respect of Wales and Monmouthshire are no longer included.

The International Union of Air Pollution Prevention Associations

The International Union that has now been established consists of non-governmental organisations only. Its primary functions are to promote collaboration and the exchange of information on air pollution problems, and to organize, through its member associations, international congresses. Particulars of the six founder member associations are given below. The first Congress of the Union was held in London in 1966.

The Second International Clean Air Congress will be held in Washington, D.C., U.S.A., from 8 December to 13 December, 1970. The President will be Dr. C. E. Barthel, Jnr., and the Secretary, Mr. Arnold Arch.

Air Pollution Control Association of America. 4400 Fifth Avenue, Pittsburgh, Pennsylvania 15213.

Established in 1907, with a full-time secretariat since 1950. The Association is a voluntary, co-operative, non-profit organization of 5,000 members who include engineers, scientists, enforcement officials, industrial organization and manufacturers. The Association serves as a forum for discussion of air pollution problems with technical orientation.

It publishes the monthly *Journal of the Air Pollution Control Association*, as well as its *APCA Abstracts*. The Abstracts contain summaries from 4,000 technical journals throughout the world of current air pollution literature.

The Association, governed by a body of 17 members of the Board of Directors, has the purposes of fostering the control of air pollution and improving sanitation of the air. The Association's Technical Council, composed of 40 volunteer committees, works towards international adoption of reasonable engineering performance standards. In addition to members from the United States, the Association presently has members from 40 other countries.

President, 1969-70: Victor H. Sussman.

Executive Secretary: Arnold Arch.

Asociación Argentina Contra la Contaminación del Aire. Sarmiento 680, Buenos Aires, Argentina.

Founded in 1962 as a result of the first Latin American Conference on Air Pollution, and obtained the legal status of a civil association in 1964.

The present membership of 100 includes doctors in medicine, hygiene and chemistry; sanitary engineers, army officers, executives and industrial enterprises. Though non-governmental, many of the members are civil service officers. A grant is made to the association by the municipality of Buenos Aires.

The aims are for the public welfare and to promote the fight against air pollution in the urban and industrial centres of the country, employing scientific, educational and cultural means. An international conference was held at Buenos Aires in November, 1965.

President: Dr. José A. Rispoli.

Secretary-General: Dr. Damian D. Torti.

Asociación Mexicana Contra La Contaminación del Agua. Y del Aire, A.C., Mexico City, Mexico.

President: Humberto Bravo.

General Secretary: Miguel A. G. Lara.

Association pour la Prévention de la Pollution Atmosphérique. 62 rue de Courcelles, Paris, 8, France.

The objects of the Association are to initiate and co-ordinate studies leading to a better understanding of the problems of air pollution; to organize investigations in the large towns with a view to determining the distribution of air pollution (for which regional groups have been set up); to co-operate with the public authorities in pollution control; to inform and instruct the public; to present exhibitions under the patronage of the Ministry of Social Affairs in the large towns; and to publish the three-monthly journal *Pollution Atmosphérique.*

President: M. le Professeur Moureu

Secretary-General: M. Y. Queret.

National Society for Clean Air. Field House, Breams Buildings, London, E.C.4, England.

Full details of the Society will be found in later pages of this volume.

Heat Control Society, Japan. Kanto-Shin-Etsu Heat Control Society, 9-17, chóme, Mejorodai, Bunkyo, Tokyo, Japan.

The purposes and activities of the Society are to conduct diagnoses of problems, lecture and training courses (including by correspondence) and other publicity activities to promote efficiency of fuels for the following purposes: (i) prevention of loss of fuels; (ii) prevention of heat losses during transmission and transportation; rationalization of combustion, gasification, distillation, heating and heat transmission; and prevention of air pollution from industrial plant.

There are seven other similar societies covering the whole area of Japan. The eight organize central conferences on heat control. Total expenditure is about £63,000 and total membership about 1,900 concerns.

Central Conference on Heat Control
President: Arimasa Baba, D.E.
Standing Director: Takahide Taga

Kanto-Shin Etsu Heat Control Society
President: Shige Kaweda
Chief Director: Takahide Taga

The Clean Air Society of Australia & New Zealand

Hon. Secretary: G. J. Cleary, Post Office Box 31, George Street North Post Office, Sydney, New South Wales, Australia.

V.D.I.-Kommission Reinhaltung der Luft. Dusseldorf, Graf-Recke-Str. 84, Federal Republic of Germany.

The V.D.I. Clean Air Commission is a specialized section of a technical and scientific association the Verein Deutscher Ingenieure (German Association of Engineers). This Commission comprises collaborators from all the branches of knowledge relating to clear air (including practice legislation and administration), because air pollution is a complex challenge to science.

Their functions include: determining the causes, nature and extent of air pollution; making emission limits for dust and gases; research on the emission of pollutants and on chimney heights; research on the effects of air pollution; fixing the maximum allowable concentrations for ambient air (Maximale Immissions-Konzentrationen, or M.I.K.); establishment or development of standard procedures for the measurement of dusts and gases both at the discharge points and in ambient air.

There are at present in the Commission more than 500 independent experts and scientists (engineers, physicists, chemists, meteorologists, hygienists, botanists, etc.) working in honorary capacities on numerous committees, sub-committees and working-groups. The results of their work are laid down in V.D.I. Richtlinien (directives)—Handbuch Reinhaltung der Luft (*Clean Air Handbook*)—arranged as follows: (i) General; (ii) M.I.K. values; (iii) dispersion of pollutants; (iv) limiting emissions; (v) analysis and measuring techniques. So far, 70 directives have been published; 40 others are either in preparation or planning stage. Furthermore since 1955 the Commission has initiated more than 120 research studies, of which a great part has already been finished. More than 12 million D. Marks have been provided by public funds for this purpose. (More details of the work of the Commission are included in a booklet "Aufbau, Aufgaben, Forschung", which will be supplied on request by the Commission.)

President: H. Stephany, Min.-Dirig. a.D. Dipl.-Ing.

Secretary: J. Krämer, Dipl.-Ing.

Besides the V.D.I. Clean Air Commission there exists a special documentation centre (V.D.I.-Fachdokumentation Reinhaltung der Luft) which covers the publications in the whole field of air pollution. Up to now, nearly 50,000 citations have been collected and indexed according to a special system. Comprehensive bibliographies are in preparation.

Secretary: W. Seidl.

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see page 112

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with Air Pollution Interests

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Alkali Inspectorate:

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Deputy Chief Inspectors, Ministry of Housing and Local Government, Whitehall, London, S.W.1. (01-930 4300 Ext. 54 and 61.)

Chief Inspector for Northern Ireland, Mr. D.Hinchliff, Government of Northern Ireland, Ministry of Health and Social Services, Room 622 Dundonald House, Upper Newtownards Road, Belfast, BT4 3SF. (Belfast 650111).

Chief Inspector for Scotland, Scottish Development Department, 21 Hill Street, Edinburgh, 2. (031-226 5208).

Architects and Surveyors, Incorporated Association of, 29 Belgrave Square, London, S.W.1. (01-235 3755/7).

Architects, Royal Institute of British, 66 Portland Place, London, W1N 4AD. (01-580 5533).

Arts, Royal Society of, 6-8 John Adam Street, London, W.C.2. (01-839 2366).

BISRA—The Inter-Group Laboratories of the British Steel Corporation, 24 Buckingham Gate, London, S.W.1. (01-828 7931).

British Independent Steel Producers' Association, 5 Cromwell Road, S.W.7. (01-581 0231).

British Industrial Measuring and Control Apparatus Manufacturers' Association, 23/24 Margaret Street, London W1N 7LB. (01-580 9336).

British Internal Combustion Engine Research Association, 111/12 Buckingham Avenue, Slough, Bucks. (Slough 27371).

British Ironfounders' Association, 30 St. James's Square, London, S.W.1. (01-930 6866 and 6436) and Fleming House, Renfrew Street, Glasgow, C.3. (041-332 0826-7).

British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1. (01-387 4499).

British Oil & Gas Firing Equipment Manufacturers' Association, Old Boundary House, London Road, Sunningdale, Berks. (Ascot 20294).

British Standards Institution, British Standards House, 2 Park Street, London, W.1. (01-629 9000).

British Steel Corporation, P.O. Box No. 403, 33 Grosvenor Place, London, S.W.1. (01-235 1212).

Building Centre, The, 26 Store Street, London, W.C.1. (01-636 5400).

Cast Iron Research Association, British, Alvechurch, Birmingham. (0739 2 2715).

Central Electricity Generating Board, Sudbury House, 15 Newgate Street, London, E.C.1. (01-248 1202).

Centre for Environmental Studies, 5 Cambridge Terrace, Regent's Park London, N.W.1. (01-486 3956).

Chemical Engineers, Institution of, 16 Belgrave Square, London, S.W.1. (01-235 3647).

Chemistry, Royal Institute of, 30 Russell Square, London, W.C.1. (01-580 3482).

City and Guilds of London Institute, 76 Portland Place, London, W.1. (01-580 3050).

Civic Trust, 18 Carlton House Terrace, London, S.W.1. (01-930 0914).

Civil Engineers, Institution of, Great George Street, London, S.W.1. (01-839 3611).

Clean Air Council, Ministry of Housing and Local Government, Whitehall, London, S.W.1. (01-930 4300 Ext. 345).

Clean Air Council for Scotland, Scottish Development Department, 21 Hill Street, Edinburgh, 2. (031-226 5208).

Clean Air, National Society for:

Central Offices: Field House, Breams Buildings, London, E.C.4. (01-242 5038).

East Midlands Division: Health Department, Town Hall, Chesterfield. (0246 77232).

North-East Division: Health and Social Services Department, Civic Centre, Barras Bridge, Newcastle-upon-Tyne, 1. (0632 28520).

North-West Division: Health Centre, Salford, Lancs. (061-736 5891, Ext. 263).

Northern Ireland Division: Public Health Department, 414 Ormeau Road, Belfast, 7. (0232 642905).

Scottish Division: 73 John Street, Glasgow. (041-221 9600. Ext. 2425).

South East Division: Public Health Department, Drayton Hall, West Drayton, Middx. (WE3 2275).

South Wales and Monmouthshire Division: 9 Lodge Drive, Baglan, Port Talbot, Glam. (0639 6 2244 Ext. 45).

South West Division: St. Clement's House, Marsh Street, Bristol, 1. (0272 26241).

West Midlands Division: Public Health Inspector's Office, Municipal Buildings, (Cradley Heath, Warley, Worcs. 0384 66891).

Yorkshire Division: Public Health Department, 12 Market Buildings, Vicar Lane, Leeds, 1. (0532 30211. Ext. 29).

Coal Board, National, Hobart House, Grosvenor Place, London, S.W.1. (01-235 2020).

Coal Utilisation Council, 19 Rochester Row, London, S.W.1. (01-834 2339).

Coal Utilisation Research Association, British, Randalls Road, Leatherhead, Surrey (537 4411).

Coke Distributors' Associations, National Federation of, Terminal House, 52 Grosvenor Gardens, London, S.W.1. (01-730 6120).

Area Offices:

London and Counties C.D.A.: Terminal House, 52 Grosvenor Gardens, London, S.W.1. (01-730 6129).

Midland Counties C.D.A.: Fuel House, 12 George Road, Edgbaston, Birmingham, 15. (021-454 8225).

Northern C.D.A.: 54/55 Bondgate, Darlington, Co. Durham. (0325 2832).

North Eastern C.D.A.: West Bar Chambers, 38 Boar Lane, Leeds, 1. (0532 33361).

Wales C.D.A.: 4 Dock Chambers, Bute Street, Cardiff. (0222 29649).

Lancashire and District C.D.A.: Whitworth House, 115 Princess Street, Manchester, 1. (061-236 3437).

Coke Oven Managers' Association, Waveney House, Adwick Road, Mexborough, Yorkshire.

Coke Research Association, British, Chesterfield, Derbys. (Chesterfield 76821).

Combustion Engineering Association, Trident House, Station Road, Hayes, Middlesex. (01-573 1393 and 2967).

Confederation of British Industry, 21 Tothill Street, London, S.W.1. (01-930 6711).

Corrosion Technology, The Institution of, 14 Belgrave Square, London, S.W.1. (01-235 9189).

Council for the Protection of Rural Wales, (Cymdeithas Diogelu Harddwch Cymru), Meifod, Montgomeryshire. (Meifod 383).

County Boroughs' Association, Guildhall, Kingston upon Hull. (Kingston upon Hull 36880).

County Councils Association, Eaton House, 66A Eaton Square, London, S.W.1. (01-235 5173).

County Councils in Scotland, Association of, 3 Forres Street, Edinburgh. (031-225 1626/7).

Derbyshire Clean Air Joint Consultative Committee, Town Clerk's Office, Town Hall, Chesterfield. (0246 77232).

Domestic Heating Society, Norwich House, 58/62 High Street, Epsom, Surrey.

Domestic Solid Fuel Appliances Approval Council, 19 Rochester Row, London, S.W.1. (01-834 2339).

Electrical Association for Women, 25 Foubert's Place, London, W.1. (01-437 5212).

Electrical Engineers, Institution of, Savoy Place, London, W.C.2. (01-240 1871).

Electrical Research Association: Offices, Library and Laboratories, Cleeve Road, Leatherhead, Surrey. (537 4151).

Electricity Council, 30 Millbank, London, S.W.1. (01-834 2333).

Esso Petroleum Co. Ltd., Victoria Street, London, S.W.1. (01-834 6677).

Forest Products Research Laboratory, (Ministry of Technology), Princes Risborough, Aylesbury, Bucks. (Princes Risborough 3101).

Fuel, Institute of, 18 Devonshire Street, London, W.1. (01-580 7124).

Fuel Technology, College of, 90 Talbot Road, Highgate, London, N.6. (01-340 6972).

Gas Council, 59 Bryanston Street, Marble Arch, London, W.1. (01-723 7030).

Gas Engineers, Institution of, 17 Grosvenor Crescent, London, S.W.1. (01-245 9811).

Gas Industries, Society of British, 16 Grosvenor Crescent, London, S.W.1. (01-235 5632 and 3940).

Great Britain, Royal Institution of, 21 Albemarle Street, London, W.1. (01-493 5716).

Health and Social Security, Department of, Alexander Fleming House, Elephant and Castle, London, S.E.1. (01-407 5522).

Health Education, Central Council for, Tavistock House, North Tavistock Square, London, W.C.1. (01-387 3341).

Health, Royal Society of, 90 Buckingham Palace Road, London, S.W.1. (01-730 5134).

Heating and Ventilating Engineers, Institution of, 49 Cadogan Square, London, S.W.1. (01-235 7671/2/3).

Hospital Engineering, Institute of, 20 Landport Terrace, Southsea, Hampshire. (Portsmouth 23186).

Housing and Local Government, Ministry of, Whitehall, London, S.W.1. (01-930 4300). (*See also Alkali Inspectorate*).

Housing Centre Trust, 13 Suffolk Street, London, S.W.1. (01-930 2881).

Institute for Conservation of Historic & Artistic Works, International, 176 Old Brompton Road, London, S.W.5. (01-373 5975)

Institute of Housing Managers, Victoria House, Southampton Row, London, W.C.1. (01-242 3267/8).

Institution on Corrosion Technology, The 14 Belgrave Square, London S.W.1. (01-235 9189).

Iron Council, Joint, 14 Pall Mall, London, S.W.1. (01-930 7171).

London Boroughs Association, Westminster City Hall, Victoria Street, London, S.W.1. (01-828 8070).

Low Temperature Coal Distillers' Association of Great Britain Ltd., P.O. Box No. 21, Chesterfield, Derbyshire. (0246 82 2281/9).

Manchester and District Regional Clean Air Council, Town Hall, Manchester, 2. (061-236 3377, Ext. 2551).

Mechanical Engineers, Institution of, 1 Birdcage Walk, London, S.W.1. (01-930 7476).

Medical Officers of Health, The Society of, Tavistock House South, Tavistock Square, London, W.C.1. (01-387 3923).

Medical Research Council, Air Pollution Research Unit, St. Bartholomew's Hospital Medical College, Charterhouse Square, London, E.C.1. (01-253 1537).

Meteorological Office, London Road, Bracknell, Berkshire. (0344 20242).

Meteorological Office, Weather Centres:
Forecasts, London: 01-836 4311.
Glasgow: 041-248 3451.
Manchester: 061-832 6701.
Newcastle: 0632 26453.
Southampton: 0703 28844.

Meteorological Society, Royal, 49 Cromwell Road, London, S.W.7. (01-589 0730).

Midlands Joint Advisory Council for Clean Air and Noise Control, The Limes, Dudley Road, Sedgley, Staffs.

Motor Industry Research Association, The, Lindley, Nr. Nuneaton, Warwickshire (Nuneaton 3664).

Municipal Corporations, Association of, 36 Old Queen Street, Westminster, London, S.W.1. (01-930 9861).

Municipal Engineers, Institution of, 25 Eccleston Square, London, S.W.1. (01-834 5082/3).

National Housing and Town Planning Council Incorporated, 11 Green Street, London, W.1. (01-629 7107/8).

National Industrial Fuel Efficiency Service, Abford House, 15 Wilton Road, London, S.W.1. (01-828 8241)
Area Offices:
North Eastern: St. Paul's House, 20/22 St. Paul's Street, Leeds, 1. (0532 20046).
44A Great North Road, Newcastle upon Tyne. (0632 813776).
London and South Eastern: 54/58 Bartholomew Close, London, E.C.1.
8 Queen Anne Terrace, Gonville Place, Cambridge. (0223 56271).
Wales and South Western: Baltic House, Mountstuart Square, Cardiff, (0222 33825).
West Midlands: 26 Calthorpe Road, Edgbaston, Birmingham, 15. 021-454-4471.
East Midlands: Wellington House, 190 Derby Road, Nottingham, (0602 44753).
North Western: 89 Oxford Street, Manchester, 1. (061-236 9228).
Scotland: 6 Park Terrace, Glasgow, C.3. (041-332 2453).
49 Meadowside, Dundee. (0382 22179).
Northern Ireland: 412 Antrim Road, Belfast (0232 76246).

Central Repair Dept., Croydon House, Croydon Street, Leeds 11. (0532 35978)

National Trust for Places of Historic Interest or Natural Beauty, 42 Queen Anne's Gate, London, S.W.1. (01-930 0211).

Parliamentary and Scientific Committee, 7 Buckingham Gate, London, S.W.1. (01-834 2608).

Petroleum, Institute of, Atmospheric Pollution Committee, 61 New Cavendish Street, London, W.1. (01-580 3583).

Power, Ministry of, Thames House South, Millbank, London, S.W.1. (01-222 7000).

Preservation of Rural England, Council for the, 4 Hobart Place, London, S.W.1. (01-235 4771).

Protection of Ancient Buildings, Society for the, 55 Great Ormond Street, London, W.C.1. (01-405 2646).

Public Health and Hygiene, Royal Institute of, 28 Portland Place, London, W.1. (01-580 2731/2).

Public Health Engineers, Institution of 32 Eccleston Square, London, S.W.1. (01-834 3017).

Public Health Inspectors, Association of, 19 Grosvenor Place, London, S.W.1. (01-235 5158/9).

Road Transport Engineers, The Institute of, 1 Cromwell Place, Kensington, London, S.W.7. (01-589 3744).

Royal Institution of Great Britain, 21 Albemarle Street, London, W.1. (01-493 0669 and 5716).

Rural District Councils Association, 147 Victoria Street, Westminster, London, S.W.1. (01-828 7425/8).

Sanitary Association of Scotland, Royal, 150 St. Vincent Street, Glasgow. (041-221 6606).

Scottish Counties of Cities Association, City Chambers, Edinburgh. (031-225 2424).

Scottish Development Department, 21 Hill Street, Edinburgh, 2. (031-226 5208).

Sheffield and District Clean Air Committee, Town Hall, Sheffield. (0742 26444).

Shell-Mex and B.P. Ltd., Shell-Mex House, Strand, London, W.C.2. (01-836 1234).

Social Service, National Council of, 26 Bedford Square, London, W.C.1. (01-636 4066).

Solid Smokeless Fuels Federation, York House, Empire Way, Wembley, Middlesex. (01-902 5405).

Standing Conference of Co-operating Bodies, Warren Spring Laboratory, (Ministry of Technology), Gunnels Wood Road, Stevenage. Herts. (0438 3388).

Stationery Office, Her Majesty's, Atlantic House, Holborn Viaduct, London, E.C.1. (Headquarters (01-248 9876) and at Sovereign House, St. Georges Street, Norwich NOR 76A. (Norwich 22211).

Steel Castings Research and Trade Association, East Bank Road, Sheffield, (0742 28647).

Structural Insulation Association, 32 Queen Anne Street, London, W.1. (01-580 7616).

Technology, Ministry of, Millbank Tower, Millbank, London, S.W.1. (01-834 2255). See also Forest Products Research Laboratory and Warren Spring Laboratory.

Tees-side Clean Air Committee, Town Clerk's Office, Municipal Buildings, Middlesbrough. Tees-side. (0642 45984).

Town and Country Planning Association, 28 King Street, Covent Garden, London, W.C.2. (01-836 5006).

Town Planning Institute, 26 Portland Place, London, W.1. (01-636 9107/8/9).

Urban District Councils' Association, Palace Chambers, Bridge Street, London, S.W.1. (01-930 4868).

Warren Spring Laboratory, (Ministry of Technology), Gunnels Wood Road, Stevenage, Herts. (0438 3388).

Warwickshire Clean Air Council, Council House, Coventry (Coventry 25555).

West Bromwich Clean Air Council, C. R. Cresswell, Esq., Secretary, West Bromwich Corporation, P.O. Box No. 40, Town Hall, Lombard Street West, West Bromwich.

West Lancashire and Cheshire Regional Smoke Abatement Committee, c/o Health Department, Hatton Garden, Liverpool, 3. (051-227 3911. Ext. 180).

West Riding Clean Air Advisory Council, Public Health Department, 25 East Parade, Leeds, 1. (0532 30661).

Women of Great Britain, National Council of, 36 Lower Sloane Street, London, S.W.1. (01-730 0619).

Women's Advisory Council on Solid Fuel, The, 18 South Molton Street, London, W.1. (01-629 5358).

Women's Gas Federation and Young Homemakers, 5 Grosvenor Crescent, London, S.W.1. (01-235 3368/9).

Overseas

Argentine

Asociación Argentina Contra la Contaminación del Aire, Juncal 1699, Buenos Aires.

Australia

Clean Air Society of Australasia, P.O. Box 31, George Street North P.O., Sydney, New South Wales.

Dept. of Public Health, Box 65, Rundle Street, Adelaide, South Australia.

Dept. of Health, George Street, Brisbane, Queensland.

Dept. of Health Services, 24 Campbell Street, Hobart, Tasmania.

Dept. of Health, 316 Queen Street, Melbourne, Victoria.

Dept. of Public Health, 57 Murray Street, Perth, Western Australia.

Dept. of Public Health, N.S.W. Air Pollution Control Branch, 86-88 George Street, Sydney, N.S.W.

Austria

Austrian Society of Industrial Medicine, Kinderspitalgasse 15, Vienna, 9.

Belgium

Centré Scientifique et Technique de la Construction 5 rue de la Violette, Brussels, 1.

Conseil National Contre la Pollution de l'Air, 6, Place de Martyrs, Brussels.

Society of Health and Social Medicine. Secretary: Professor Graffar, Professor of Social Medicine, Liberal University of Brussels.

Cebedair, 2, rue Armand Stévart, Liége.

International Iron and Steel Institute, 5, Place du Champ de Mars, Brussels 5.

Brazil

Associação Brasileira de Prevenção à Poluição do Ar.
Rua Catumb, 318 - 6° ander, São Paulo, 2.P.7.

Canada

British Columbia Clean Air Association, 2907 West 42nd Avenue, Vancouver 13, B.C.

Dept. of National Health and Welfare. Environmental Assessment Unit Occupational Health Division, 455 Spencer Street, Ottawa 4, Ontario.

Czechoslovakia

Czech Polytechnic University of Prague, Faculty of Mechanical Engineering, Department of Air Engineering, Praha 6, Technická 1902.

Czechoslovak Academy of Sciences, Institut for Physics of the Atmosphere, Praha 4, Spořilov, Boční 11.

Czechoslovak Institut of Physical Chemistry, Department of Physical Chemistry of Aerosols, Praha 2, Máchova 7.

Institut of Hygiene, Praha 10, Srobarova 48.

Power Research Institut, Praha 7, Partizánská 7a.
Research Institut of Air Engineering, Praha 10, Malešice.

Denmark

Cinderkoks Information, Raadhuspladsen 59, Copenhagen 5.
Densk Kedelforening Vesterbrogade I.A., Copenhagen.
National Health Service of Denmark, 1 St. Kongensgade, Copenhagen K.

Finland

Finnish Council for Air Conservation and Noise Abatement, Haartmaninkatu 1, Helsinki 25.
Ministry of Internal Affairs, Aleksanterinkatu 3D, Helsinki.

France

Association pour la Prévention de la Pollution Atmosphérique. M. Yvan Queret, 62 rue de Courcelles, Paris 8.
Association Technique de l'Industrie du Gaz en France, 62, rue de Courcelles, Paris, 8.
Centre d'Information pour le Développement de Conditionnement d'Air, de la Ventilation, du Filtrage de l'Air et du Dépoussierage, 38 rue Copernic, Paris 16.
Centre Interprofessionnel Technique d' Études de la Pollution Atmosphérique (C.I.T.E.P.A.), 28 rue de la Source, 75 - Paris (XVI^{e}).
Charbonnages de France, 9 Avenue Percier, Paris 8.
Delégation Génerale à la Recherche Scientifique et Technique, 103 rue de l' Université, Paris - 7.
Electricité de France, 11 bis, rue d' Aguesseau, Paris 8.
Institut National d'Hygiène, 11 bis rue de Milan, Paris 9.
Institut Français des Combustibles et de l'Energie, 3 rue Henri Heine, Paris 16.
Institut National de Recherche Chimique Appliquée, 12 Quai Henri IV, Paris 4.
Laboratoire Municipal de la Préfecture de Police, 39 bis rue de Dantzig, Paris 15.
Societé Française des Pétroles BP, 21 rue de a Bienfaisance, Paris 8.
Union Européenne de Medicine Sociale, 1 rue de Courcelles, Paris 9.

Germany

Abgasprüfstelle der DDR, Rudower Chausee 6, 1199 Berlin - Aldershof.
Agrikulturchemisches Institut, Heiligenhaus Bez, Am Vogelsang 14, Düsseldorf.
Bundesministerium für Gesundheitswesen, Michaelstr 10, Bad Godesberg.
Deutsche Gesellschaft für Mineralölwissenschaft und Kohlechemie e.V. Mittelweg 180, Hamburg 13.
Deutscher Stadtetag, Lindenallee 11, Köln-Marienburg.
Deutscher Verein von Gas-und Wasserfachmännern. Beethovenstr. 17, Frankfurt (Main).
Federal Ministry of Health, Michaelstr. 10. 532 Bad Godesberg.
Gaswärme-Institut Essen e.V. Holbeckshof, Essen-Steele 43.
Hygienisches-Institut, Neuer Kamp 25, Hamburg 6.
Hygiene-Institut de Humboldt-Universität, Otto-Grotewohl-Str. 1. 108 Berlin.
Institut fur Gewerbliche Wasserwirtschaft und Luftreinhaltung, Hohenzollernring 38-40, 5000 KÖLN.
Institut für Grubensicherheit und Arbeitsschutz, Kirchgasse 11, Freiberg/Sa.
Institut für Technische Physik der Frauenhofer-Gesellschaft, Königstr 70/74, Stuttgart-Degerloch. Dr.-Ing. Reiher, Director.
Institut für Wasser, Boden und Lufthygiene Corrensplatz 1, Berlin 33.
International Union for Conservation of Life (IUCL).
Secretary: Institut für Biologie und Lebensschutz, D 6229 Schlangenbad—Georganhorn.
Landesinstitut für Arbeitsschutz und Arbeitsmedizin, Kaiserallee 61, 75 Karlsruhe.
Landesanstalt für Bodennutzungsschutz des Landes Nordrhein-Westfalen, 4300 Essen, Eststr. 160.
Ruhrkohlen-Beratung GmbH, Frau-Bertha-Krupp-Str. 4, Essen.
Staubforschungsinstitut des Hauptverbandes der Gewerblichen Berufsgenossenschaften e.V. Langwartweg 103, Bonn. Prof. Winkel, Director.
Steinkohlenbergbauverein, Friedrichstr 2, Essen 1. Prof. Weissner.
Technischer Überwachungs-Verein Essen e.V. Steubenstr. 53, Essen 1.
Verein Deutscher Eisenhüttenleute, Breite Strasse 27, Düsseldorf.
Verein Deutscher Ingenieure (Kommission Reinhaltung der Luft), Prinz Georg Strasse 77/79, Düsseldorf. Secretary: M. Krämer.
Vereinigung der Grosskesselbesitzer e.V. Kurfürstenstr. 27, Essen 1.

India

All Indian Institute of Hygiene and Public Health. Industrial Health Research Unit, Section of Physiological and Industrial Hygiene, Calcutta.
Central Public Health Engineering Research Institute, 70-71 Civil Lines, Nagpur.

Israel

Central Laboratory of Air Pollution and Radiation Hazards, 27 Prof. Shor St. Tel-Aviv.
Public Council for the Prevention of Noise and Air Pollution, Tel-Aviv, P.O. Box 20127.

Italy

Consiglio Nazionale delle Ricerche Pizzale delle Scienza 7, Rome.
ILVA Society, Via Corsica 4, Genoa.
Institute of Hygiene, University of Ferrara, Corso Giovecca 173A, Ferrara.
Institute of Hygiene, University of Genoa, Via A. Pastore 1, Genoa.
Instituto di Ingegneria Sanitaria del Politecnico di Milano, Piazza Leonardo da Vinci 32, Milan.
Instituto Superiore di Santia, Viale Regina Elena 299, Rome.
Stazione Sperimentale per i Combustibili, Via De Gasperi 3, Milan.
NANS (Union of Nations for Fight against Noise and Smog) via Garibaldi, 25, Turin.

Japan

The Institute of Public Health, 1-39, Shiba Shirogane Daimachi, Minato-ku, Tokyo.
Kanto-Shin-Etsu Heat Control Society, 54 Takata-Oimatsu-cho, Bunkyo-ku, Tokyo.
Osaka Institute of Hygiene, 38 Kitaogimachi, Kita-Ku, Osaka.

Malta

National Society for Clean Air of Malta, 8-10 Civic Centre, Senglea.

Mexico

Instituto de Geofisica, Torre de Ciencias, Ciudad Universitaria, Mexico 20.

Netherlands

Atmospheric Pollution Division; 14 Duinweg, The Hague.
Central Organization/Applied Scientific Research T.N.O., Committee for Industrial Air Pollution, 12, Koningskade, The Hague.

Commission for Soil, Water, and Air, Baan 170, Rotterdam.
Council for Air Pollution, Zeestraat 73, The Hague.
Netherlands Association for Water, Soil and Air Pollution. Nienwe Achtergracht 100, Amsterdam.
Research Institute for Public Health Engineering T.N.O., (Organization for Health Research T.N.O.) Industrial Air Pollution Division, 97, Schoemakerstraat Delft.
Stichting Concawe (For conservation of clean air and water from oil refinery activities in Western Europe). Secretary: Mr. E. H. Hubbard, 21 President Kennedy Laan, The Hague.

Norway

Institute of Hygiene, University of Oslo, Blindern, Oslo.
Røykskaderädet, Meltzersgt 4, Oslo Dep. Oslo 1.

Poland

Air Pollution Control, Central State Board for National Water Economy, ul. Swietokrzyska 12, Warsaw.
Polish Academy of Sciences, ul. Hagera 17, Zabrze.

Portugal

Instituto Superior Ciencias, Sociais Universidade Técnica, Lisbon.

South Africa

Air Pollution Research Group of the Council for Scientific and Industrial Research, P.O. Box 395, Pretoria, Transvaal.

Spain

Municipal Institute of Hygiene, Place de Lesseps 1 Barcelona.

Sweden

AB Svenska Fläktfabriken, Kungsgatan 18, Stockholm.
Institutet för Vatten-och Luftvårdsforskning, Drottning Kristines väg 47 D, Stockholm.
National Institute of Public Health, Stockholm 60.
Swedish National Committee for Air Purification, Sveavärgen 166 XI, Stockholm.

Switzerland

Eidgenössische Kommission für Luftthygiene Kreuzstrasse 26, 8008 Zürich.

U.S.A.

Air Pollution Control Association, 4400 Fifth Avenue, Pittsburgh, 15213.
Bituminous Coal Research Inc., 35 Hochberg Road, Monroe, Pittsburgh 13, PA.
National Air Pollution Control Administration, 801 N. Randolph Street, Arlington, Virginia 22203.

Other U.S. Governmental Air Pollution Agencies and individual State Agencies are listed in an annual Directory published by the Air Pollution Control Association in co-operation with the U.S. Dept., of Health, Education and Welfare. A copy of this Directory is available at the library of the National Society for Clean Air.

U.S.S.R.

Institute of Communal Hygiene, Pogodinskaja 10, Moscow.
Medical Control Committee on Air Pollution, State Medical Commission, Moscow.

World Health Organization

Division of Environmental Sanitation, Palais des Nations, Geneva, Switzerland.

NATIONAL SOCIETY FOR CLEAN AIR

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South West: G. W. Dhenin, P. Draper (co-opted).

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Divisional Councils

Scotland: M. M. Beaton, *President:* John W. Traill, *Hon. Secretary*, 73 John Street, Glasgow. 041–221 9600 Ext. 2425.

Northern Ireland: R. Campbell Brown, *Chairman:* W. E. C. O'Brien. *Hon. Secretary*, Down County Health Dept., 414 Ormeau Road, Belfast, 7. Belfast 642905.

North West: Miss N. Kenyon, *Chairman:* W. E. Pollitt, *Hon. Secretary*, Health Centre, Salford, Lancs. 061–736 5891 Ext. 263.

North East: Alderman B. N. Young, *Chairman:* L. Mair, *Hon. Secretary*, Health and Social Services Department, Civic Centre, Barras Bridge, Newcastle-upon-Tyne, 1. 0632 28520.

Yorkshire: J. W. Batey, *Chairman:* James Goodfellow. *Hon. Secretary*, Public Health Dept., 12 Market Buildings, Vicar Lane, Leeds, 1. 0532 30211 Ext. 29.

West Midlands: Alderman T. Parkin, *Chairman:* W. L. Kay, *Hon. Secretary*, Public Health Inspector's Office, Municipal Buildings, Old Hill, Staffs. 0384 66891.

East Midlands: Councillor F. Brothwell, *Chairman:* G. Drabble, *Hon. Secretary*, Health Department, Town Hall, Chesterfield. 0246 77232 Ext. 260.

South East: W. Combey, *Chairman:* J. S. Hodgins, *Hon. Secretary*, Public Health Department, Drayton Hall, West Drayton, Middlesex. 933 2275.

South West: Alderman C. Hebblethwaite, C.B.E., *Chairman:* G. J. Creech, M.B.E., *Hon. Secretary*, St. Clement's House, Marsh Street, Bristol, 1. 0272 26241.

South Wales and Monmouthshire: Alderman Dr. C. A. Bence, *Chairman:* L. Morgan, *Hon. Secretary*, 9 Lodge Drive, Port Talbot, Glamorgan. 06396 2244 Ext. 45.

SUSTAINING MEMBERS

Sustaining Members are defined in the Society's Articles of Association as members of any class—Individual, Local Authority or Corporate—who make an annual contribution of £100 or more. The following were the Sustaining Members at 31 March, 1969.

British Petroleum Co. Ltd.
British Steel Corporation
Central Electricity Generating Board
Coal Merchants Federation of Great Britain
Coalite & Chemical Products Ltd.
East Midlands Gas Board
Electricity Council
Esso Petroleum Co. Ltd.
Gas Council
Greater London Council
Imperial Chemical Industries Ltd.
London & Counties Coke Distributors' Association
Mather & Platt Ltd.
National Carbonising Co. Ltd.
National Coal Board
Northern Gas Board
North Thames Gas Board
North Western Gas Board
Scottish Gas Board
Shell Chemicals (U.K.) Ltd.
Shell International Petroleum Co. Ltd.
Shell-Mex & B.P. Ltd.
Simon Carves Ltd.
Solid Smokeless Fuels Federation
South Eastern Gas Board
West Midlands Gas Board

Local Authority Members

(*as at* 1 *January*, 1969)

(Associate Members in *Italics*)

Scottish Division

Aberdeen, Airdrie, *Ayr C.C.*, *Ayr*, Barrhead, Clackmannan C.C., Clydebank, Coatbridge, Dumbarton, Dumfries, Dunbarton C.C., Dundee Dunfermline, East Kilbride, Edinburgh, Falkirk, Fife C.C., Glasgow, Grangemouth, Hamilton, Hawick, Inverness C.C., Inverness, Irvine, Johnstone, Kilmarnock, Kilsyth, Kirkcaldy, Kirkintilloch, Lanark C.C., Motherwell & Wishaw, Paisley, Perth C.C., Perth, *Port Glasgow*, *Renfrew C.C.*, Renfrew, Rothesay, Rutherglen, Stirling C.C., Stirling, West Lothian C.C.

Northern Ireland Division

Antrim C.C., Antrim R.D.C., Ballymena, Belfast, Carrickfergus, Castlereagh R.D.C., Londonderry, Portadown.

North West Division

Abram, Accrington, Altrincham, Ashton in Makerfield, Ashton under Lyne, Atherton, Audenshaw, Bacup, Barrow in Furness, Bebington, *Birkenhead*, Blackburn, Blackpool, Bolton, *Bootle*, Bredbury & Romiley, Brierfield, Bucklow, Burnley, Burnley R.D.C., Bury, Buxton, Chadderton, Cheadle & Gatley, Cheshire C.C., Chester, Chorley, Church, *Clitheroe*, Colne, Connah's Quay, Crewe, Crompton, *Crosby*, *Cumberland C.C.*, Darwen, Denton, Droylsden, Dukinfield, Eccles, Ellesmere Port, Failsworth, Farnworth, Fleetwood, Flint, Fulwood, Glossop, Golborne, Great Harwood, Hale, Haslingden, Haydock, Hazel Grove & Bramhill, Heywood, Hindley, Horwich, *Hoylake*, Huyton with Roby, Hyde, Ince in Makerfield, Irlam, Kearsley, Kirkby, Lancashire C.C., Lancaster, Lees, Leigh, Leyland, Littleborough, Liverpool, Longdendale, Macclesfield, Manchester, Marple, Matlock, Middleton, Middlewich, Mold, Morecambe & Heysham, Nantwich, Nelson, Newton le Willows, Northwich R.D.C., Northwich U.D.C., Oldham, Ormskirk, Padiham, Preston, Preston R.D.C., Prestwich, Radcliffe, Ramsbottom, Rawtenstall, Rhyl, *Riston*, Rochdale, Royton, Runcorn R.D.C., Runcorn U.D.C., St. Helens, Sale, Salford, Skelmersdale & Holland, *Southport*, Stalybridge, Standish with Langtree, Stockport, Stretford, Swinton & Pendlebury, *Thornton Cleveleys*, *Tintwistle*, Tyldesley, Urmston, Wallasey, Warrington, *Warrington R.D.C.*, *West Lancashire R.D.C.*, Whiston R.D.C., Whitefield, Whitworth, Widnes, Wigan, Wilmslow, Winsford, Workington, Worsley, Wrexham, Wrexham R.D.C.

North East Division

Ashington, Barnard Castle, Bedlingtonshire, Bishop Auckland, Blaydon, Boldon, Brandon & Byshottles, Castle Ward, Chester le Street R.D.C., Chester le Street U.D.C., Consett, Crook & Willington, *Darlington*, Durham R.D.C., Felling, Gateshead, Gosforth, Hartlepool, Hebburn, Hetton, Houghton le Spring, Jarrow, Lanchester R.D.C., Longbenton, Morpeth, Newburn, Newcastle upon Tyne, Northumberland C.C., Prudhoe, Ryton, Seaham, Sedgefield, Shildon, Skelton & Brotton, South Shields, Spennymoor, Stanley, Sunderland, Tees side, Tynemouth, Wallsend, Washington, Whickham, Whitley Bay.

Yorkshire Division

Adwick le Street, Aireborough, Batley, Bentley with Arksey, Bingley, Bradford, Bridlington, Brighouse, Castleford, Colne Valley, Conisbrough Cudworth, Darton, Dearne, Denby Dale, Dewsbury, Doncaster, Doncaster R.D.C., Elland, Halifax, Harrogate, Heckmondwike, Hemsworth R.D.C., Hemsworth U.D.C., Hepton, Holmfirth, Horbury, Horsforth, Hoyland Nether, Huddersfield, Ilkley, *Keighley*, Kingston upon Hull, Knottingley, Leeds, Meltham, Mexborough, Mirfield, Morley, Normanton, North Riding C.C., Ossett, Otley, Pontefract, Pudsey, Queensbury & Shelf, Rawmarsh, Rothwell, Rotherham, Royston, *Scarborough*, Sheffield & District Clean Air Committee, Shipley, Skipton, Sowerby Bridge, Spenborough, Stanley, Swinton, Thorne R.D.C., Todmorden, Wakefield, Wakefield R.D.C., Wath upon Dearne, Wombwell, Worsbrough, Wortley, *Yorks.*

West Midlands Division

Aldridge-Brownhills, Atherstone R.D.C., Bedworth, Birmingham, Burton upon Trent, Cannock R.D.C., Cannock U.D.C., Coventry, Dudley, Halesowen, Hereford, Kidderminster, Leamington Spa, Meriden R.D.C., Newcastle under Lyme, Nuneaton, Redditch, Rugby, Rugeley, Seisdon, Solihull, Stafford, Staffordshire C.C., Stoke on Trent, Stone R.D.C. Sutton Coldfield, Walsall, Warley, Warwick, Warwick R.D.C., *Warwickshire C.C.*, *Wellington*, West Bromwich, Wolverhampton, Worcester.

East Midlands Division

Alfreton, Basford R.D.C., Beeston & Stapleford, Belper R.D.C., Belper U.D.C., Bingham R.D.C., Blaby R.D.C., Blackwell R.D.C., Bolsover, Boston, Cambridge, Carlton, Chesterfield, Chesterfield R.D.C., Clay Cross, Clowne R.D.C., Coalville, Corby, Derby, Dronfield, Eastwood, Gainsborough, Glanford Brigg R.D.C., Grantham, Grimsby, Heanor, Hinckley, Hucknall, Ilkeston, Ipswich, Irthlingborough, Kettering, King's Lynn, Kirkby in Ashfield, Leicester, Lincoln, *Lincoln C.C.*, (Parts of Kesteven), *Lincoln C.C.* (Parts of Lindsey), Long Eaton, Loughborough, Lowestoft, Mansfield, Mansfield Woodhouse, Newark, Norwich, Nottingham, *Nottinghamshire C.C.*, Old Fletton, Peterborough, *Repton R.D.C.*, Rushden, Scunthorpe, Southwell R.D.C., Stavely, Sutton-in-Ashfield Swadlingcote, Wellingborough, Welton R.D.C., Wisbech, Worksop, Worksop R.D.C.

South West Division

Bath, *Bathavon R.D.C.*, *Bridgwater*, Bristol, Cheltenham, Dursley R.D.C., Gloucester, *Keynsham*, Kingswood, Lydney R.D.C., *Mangotsfield*, *Norton Radstock*, Poole, *Shepton Mallet R.D.C.*, *Sherborne*, *Sodbury R.D.C.*, Stroud, Swindon, *Tetbury R.D.C.*, *Tewkesbury*, Thornbury R.D.C., *Weston super Mare*, West Penwith R.D.C., Weymouth & Melcombe Regis.

South East Division

Amersham R.D.C., Aylesbury, Barking, Barnet, Basildon, Bedford, Bedfordshire C.C., Bexley, Bishop's Stortford, Bletchley, *Bognor Regis*, *Bournemouth*, Braintree R.D.C., Brent, Brentwood, Brighton, Bromley, Bullingham R.D.C., Bushey, Camden, Chatham, Chesham, Cheshunt, Chigwell, *Clacton*, Crawley, *Croydon*, *Cuckfield*, Dartford, Dartford R.D.C., Dover, Ealing, Eastbourne, Easthampstead R.D.C., Eastleigh, Egham, Elstree R.D.C., Enfield, Epping & Ongar R.D.C., Epsom & Ewell, Esher, *Essex C.C.*, Eton R.D.C., *Farnborough*, Folkestone, Gillingham, *Gosport*, Gravesend, Greater London Council, Greenwich, Guildford, Guildford R.D.C., Hackney, Hammersmith, Harlow, Harrow, Harwich, Hastings, Havant & Waterloo, Havering, Hemel Hempstead, High Wycombe, Hillingdon, Hitchin, Hoddesdon, Hounslow, *Hove*, *Kensington & Chelsea*, *Kent C.C.*, Kingston upon Thames, Lambeth, *Leatherhead*, Lewisham, *Littlehampton*, London, Luton, Maidenhead, Merton, New Forest R.D.C., *Newham*, Northfleet, Oxford, *Portsmouth*, *Reading*, Redbridge, *Reigate*, Richmond upon Thames, Rickmansworth, Rochester, St. Albans, Sittingbourne & Milton, Slough, *Southampton*, *Southend on Sea*, Southwark, Southwick, Staines, Strood R.D.C., Sutton, Thurrock, Tower Hamlets, *Tunbridge Wells*, Watford, Watford R.D.C., Westminster, New Windsor, Windsor R.D.C., *Worthing*, Wycombe R.D.C.

South Wales & Monmouthshire Division

Abercan, Aberdare, Abertillery, Barry, Bedwas & Machen, Bedwellty, Bridgend, Caerleon, Caerphilly, Cardiff, Cardiff R.D.C., Cwmbran, Ebbw Vale, Gellygaer, Glamorgan C.C., Llanelly, Llanelly R.D.C., Llantrisant & Llantwit Fadre R.D.C., Magor & St. Mellons R.D.C., Merthyr Tydfil, Monmouthshire C.C., Mountain Ash, Mynyddislwyn, Neath, Newport, Penarth, Pontypool, Pontypridd, Port Talbot, Rhondda, Swansea, Tredegar, Ystradgynlais R.D.C.

39th Annual Report 1968

The major event in the clean air calendar for 1968 was undoubtedly the passing of Mr. Robert Maxwell's Clean Air Bill which received the Royal Assent on Friday 25 October, 1968—the last day of the Society's Harrogate Conference, where it was described by one Speaker as "having teeth that are intended to bite".

To be known with the 1956 Act as the Clean Air Acts 1956 and 1968 the new Act supplements, extends and in part repeals the provisions of the 1956 Act. It is, to a large extent, a piece of enabling legislation by which the Minister of Housing and Local Government will be able to make Regulations and Orders further increasing or restricting its effect. Clauses 2, 6 and 8 to 15 inclusive of the Act will be brought into force on the 1st April, 1969, and the remaining clauses will be brought into operation later at dates yet to be announced. The Society welcomes this Act which represents another big step forward in the cause of clean air.

The past year for the Society has been one of consolidation. Membership has been maintained, and in spite of a period of financial stringency on all sides the income of the Society has increased. This is due to the generosity of our larger subscribers who have increased their contributions. On the other hand, costs have continued to rise steeply and it has again been necessary to draw on our reserves instead of increasing them.

Obviously, such a state of affairs could not be allowed to continue and the Executive Council therefore took action to seek an increase of subscriptions. Accordingly, an Extraordinary General Meeting was held on 23 October at the Harrogate Conference and here it was agreed that the subscription rates should be increased by an amount of about 20 per cent. It is confidently expected that the increased revenue from subscriptions together with the generous increase in contributions from our larger subscribers already referred to, will enable us to continue to expand our activities. Nevertheless, the need for an increase in membership is still paramount and it is to be hoped that every effort will be made by our existing members not only to continue to support the Society but to secure new members.

Annual General Meeting

The annual business of the Society was held in London on 25 April and this was followed by the usual luncheon. An Open Meeting was held following the business meeting at which the Speaker was the Rt. Hon. Lord Kennet, Parliamentary Secretary, the Ministry of Housing and Local Government and acting Chairman of the Clean Air Council. The title of his address was "Clean Air—Where Now?" and in it Lord Kennet reviewed the progress being made in the field of clean air. The text of his speech was published in full in the summer, 1968 issue of Smokeless Air. The Annual General Meeting also marked another landmark in the Society's history. Just after the formal business meeting and before Lord Kennet began his address, the President, Sir John Charrington made a presentation on behalf of the Society to Arnold Marsh, its Director. The presentation took the form of a cheque and of an album in which were recorded the names of all subscribers to the presentation fund.

At the time of the presentation, Mr. Marsh had not retired. He remained as Director until 31 May. The presentation was made, however, on the occasion of the Annual General Meeting, as this was the most opportune and fitting time to do it. Sir John referred to Mr. Marsh's forty years of service with the Society and of his many accomplishments in that time, one of which was unique in that Mr. Marsh was the only person outside the United States to receive the Richard Beatty Mellon Award of the Air Pollution Control Association in formal recognition of outstanding achievement in the control of air pollution. Sir John then read the following citation which has been reproduced in an illuminated form in the front of the album:

> "National Society for Clean Air
>
> In recognition of the devoted service in the promotion of clean air by Arnold Marsh Esq., O.B.E., M.SC.TECH., F.INST.F., Secretary and latterly Director of the Society, his many friends listed in this album have contributed to a presentation and wish to convey their profound thanks and esteem for his untiring efforts in the cause of clean air from 1928 to 1968 and sincerely hope that he will enjoy many years of good health and happiness in his well earned retirement."

Mr. Marsh, having accepted the cheque and the album which was bound in blue morocco leather with the head of John Evelyn emblazoned in gold on the front cover, thanked Sir John and all subscribers.

The Annual Conference and Exhibition

The Annual Conference and Exhibition was held at Harrogate from the 22 to 25 October. Harrogate again proved itself to be extremely hospitable, and the Conference, from all accounts seems to have been not only very enjoyable but also extremely successful.

The Conference was opened by Sir David Pitblado, K.C.B., C.V.O., the Permanent Secretary of the Ministry of Power. The theme of his address was the part that the Government played in fuel policy, and the full text of his address was published in the winter, 1968 issue of Smokeless Air.

The Tuesday afternoon session was given over to the subject of "Clean Air and the Future of Fuel Usage" and papers were given by Lord Robens representing the Solid Fuel Industries, Mr. P. A. Lingard from the Electricity Council, Mr. A. F. Hetherington of the Gas Council, and Mr. T. R. Grieve representing the Oil Industry. Other Conference papers were "Some Factors in the Design of Chimneys" by Dr. A. Parker; "The Determination of Chimney Heights" by Professor R. S. Scorer; "Chimneys —the Aesthetic Factor" by Mr P. D. Spawforth; "Progress at Scheduled Works" by Mr. F. E. Ireland; "Black Areas and the National Survey of Smoke and Sulphur Dioxide" by Dr. M. Clifton and Messrs. M. R. Grimoldby and A. J. Sharp; "Routine Dust Measurement Methods Developed at Central Electricity Research Laboratory" by D. H. Lucas and W. L. Snowsill; "The Monitoring Work of the C.E.G.B., with Special Reference to Techniques and Instrumentation and the Measurement of

Sulphur Dioxide" by Messrs. F. R. Barber, W. G. Cummings and E. G. Kingham; "The Influence of Traffic on Atmospheric Pollution, The High Street, Warwick" by J. Bullock and W. M. Lewis; "Progress towards Abatement of Pollution from Petrol Vehicles in Britain" by R. A. C. Fosberry; "Clean Air and Electric Vehicles" by Dr. M. Barak, and "Practical Problems in the Approach to Smoke Control" by Mr. J. Harris.

In his Presidential Address, Sir John Charrington pointed out that the response from the Ministry of Transport to the resolution passed at the Blackpool Conference in 1967 had not been very favourable. Partly as a result of this, and partly as a result of the session on the Thursday forenoon on Pollution from Road Vehicles, the following further resolution was moved and unanimously adopted at the end of the closing session: "That this conference urges the Minister of Transport to make regulations or introduce legislation to set suitable limits by a reasonable date on the emission of carbon monoxide from petrol engined vehicles, and to tighten up the regulations controlling the emission of smoke from diesel road vehicles, in order to prevent invasion of the amenities and to implement the developments carried out by the Motor Industry". This resolution has been duly submitted to the Minister of Transport.

Council and Committees

The Executive Council met regularly during the year, as did its five Committees. The Publicity Committee has been busily concerned with the production of a new emblem for the Society and also with a scheme for Clean Air Awards; it is expected that announcements about both will be made early in 1969. The Parliamentary and Local Government Committee watched with interest, and at times, apprehension, the passage of the new Clean Air Bill through both Houses of Parliament, and the Technical Committee has been very fully occupied furthering the Society's policy regarding pollution from road vehicles.

The Divisions

The Society depends to a large extent upon the activities of its Divisional Councils in maintaining and extending support for the cause of clean air in all parts of the United Kingdom. As reports published throughout the year in Smokeless Air have shown, Divisional Councils have continued to be active. Annual Reports from each of the Divisions will, of course, be published later in the Clean Air Year Book.

Publicity and Public Relations

Generally, throughout the year, the Society has had a "good press". In particular, the Conference and Exhibition received a very good press indeed. In all, 730 press cuttings about the Society have been received; of these, about half referred to the Conference.

The Society's information services have continued to be kept busy by requests for assistance from members and others, in particular research workers, students and schools, and we have had a number of visitors from overseas.

The national press has frequently requested the Society's view on important clean air matters.

Staff

Reference has already been made to the retirement of Mr. Arnold Marsh after 40 years' service, on 31 May. He was succeeded by Rear Admiral P. G. Sharp on 1 June.

At the end of the year Mr. M. W. Morgan, the Exhibition Officer, left the service of the Society after being with us for three years.

Field House, A. C. SAWORD, *Chairman*
Breams Buildings, STANLEY E. COHEN, *Hon. Treasurer*
London, E.C.4 P. G. SHARP, *Director.*
January 1969

Scottish Division

There were two meetings of the Division during the year and the Executive Committee met on three occasions. The highlight of the year was the Annual General Meeting and Conference of the Division held in Hawick from 22 to 24 May which was fully reported in the autumn issue of *Smokeless Air.*

During the year the Division was perturbed when certain local authorities indicated that they were slowing down or postponing their smoke control programmes. There is no doubt that the Government's directive to local authorities to save money in the public sector is having a serious effect on the progress of clean air in Scotland. This, along with the high cost of all types of smokeless fuels, is causing the Division a great deal of concern. In spite of all these difficulties, however, a small number of Councils are vigorously promoting their clean air programmes.

The Division congratulated the Burgh of East Kilbride on becoming the first town in Scotland and the first new town in Great Britain to be completely smoke controlled.

The classes for firemen, boiler attendants, engineers, etc., organized by the Division, in conjunction with the Health and Welfare Department of the Corporation of Glasgow, continue to flourish and the 53rd Annual Winter Session commenced in October. Ordinary and advanced classes are held and students who pass the advanced class examination can then proceed to enter for the City and Guilds of London Institute Certificates in Boiler Operation and in Boiler-House Practice and Combustion Engineering. The two courses have been well attended during the year and the Division is grateful to the Corporation of Glasgow for their help and financial assistance. Book prizes are awarded at the end of each session to the three best students in the ordinary and advanced class. The success of these classes is due in no small measure to the zeal and enthusiasm of the Lecturer, Mr. John H. Christie, Senior Smoke Inspector, Glasgow. The Division have always worked on the premise that skilled operation of boiler plants is complementary to the aims and aspirations of the Society.

J. W. TRAILL, *Hon. Secretary*

Northern Ireland Division

1968 was in some respects quiet and uneventful although the Division looks forward to increased activity during 1969. It is encouraging to learn that Local Authorities are planning to have their Districts subject to Smoke Control Orders and it is hoped that in the coming years an increasing number of such Orders will be made. The Division has drawn attention to the desirability of making new housing developments, both public and private, subject to Smoke Control Orders.

The annual output of new houses has now reached a high figure and it is hoped many of these houses will be subject to Smoke Control Orders which can be made so easily and at very little cost to public funds.

The Divisional Council Spring Meeting is to be held in Bangor on Thursday the 15 May next. Dr. S. R. Craxford of the Air Pollution Division at Warren Springs Laboratory, Stevenage, has accepted an invitation to attend the Meeting and discuss "Air Pollution Levels in Northern Ireland".

W. E. C. O'BRIEN, *Hon. Secretary*

North East Division

During the year the Division held its customary two meetings. The annual meeting held in April at the Roker Hotel, Sunderland was attended by 73 members. In his annual address the Chairman, Alderman B. N. Young, O.B.E., briefly referred to the continued lack of progress being made in air pollution abatement in the North East region and expressed the hope that the forthcoming wider availability of electricity for space heating might assist the situation. He referred once more to the excessive financial burden placed upon local authorities pursuing smoke control programmes in the North East and emphasized the importance of bearing in mind the economic impact upon the housewife when the question of smoke control and fuel usage were under consideration. He concluded his brief remarks by expressing his considerable personal pleasure at the attendance of the Director and Secretary of the Society at the meeting.

After the formal business of the meeting an address on "Electricity and Clean Air" was delivered, the first speaker being Mr. D. A. Davis of the Central Electricity Generating Board whose theme was "The Future of Electricity Generation" in which the speaker referred to the increasing share of the total energy market taken by electricity during the past half century. He referred to the generation of electricity in relation to coal, oil and nuclear power and concluded a most instructive contribution by examining the White Paper on Fuel Policy.

The second speaker was Mr. T. P. Hartley, District Manager, Sunderland, of the North Eastern Electricity Board who dealt in detail with Electricaire Installations and gave a description of the installation and its application to blocks of multi-storey flats which were to be seen by members during the afternoon visit later in the day. He illustrated his talk by reference to models and examples comprised in a small exhibition on show at the meeting and made detailed reference to the economics of the operation of these installations.

After a lengthy discussion a vote of thanks was proposed by M. J. R. Wilson, the Chief Public Health Inspector of Jarrow. Arising from the discussion on the speakers' papers it was proposed by Mr. R. Emerson, Chief Public Health Inspector of the County Borough of Hartlepool and seconded by Mr. R. V. Robinson, Chief Public Health Inspector of South Shields, that the following resolution be sent to the Executive Council of the Society and that it be forwarded to the Minister of Housing and Local Government as a matter of urgency.

> "That this meeting urges the Minister of Housing and Local Government to rescind the designation of the direct operating electric fire to enable grants to be paid for the installation of electric fires in smoke control areas."

Members were entertained to lunch by the North Eastern Electricity Board at the conclusion of which Arnold Marsh, the Director of the Society, delivered a very amusing farewell speech on this his last visit to the Division prior to retirement.

The second meeting of the Division was held at the Department of Civil Engineering in the University of Newcastle-upon-Tyne in October on which occasion the principal speakers were Dr. Ian Gregg, Consultant Chest Physician, and Professor Peter C. G. Isaac, Vice-Chairman of the Divisional Council and Professor of Civil and Public Health Engineering in the University. Dr. Gregg recounted a number of case histories of chronic bronchitis and related these to smoking habits and air pollution. Professor Isaac dealt generally with the control and prevention of air pollution and the concluding discussion ranged over the subjects introduced by both speakers.

Throughout the year various members of the Division have drawn attention to the difficulties peculiar to the North East which will arise when local supplies of open fire solid smokeless fuel are no longer available in existing smoke control areas, a question which has been discussed at length by your Chairman and Secretary with solid fuel interests in the region. It is to be hoped that well in advance of the disappearance of Gloco in the region a clear cut solution to the problem will have been found.

L. MAIR, *Hon. Secretary*

North West Division

The Annual General Meeting of the North West Division was held at the Manchester Race Course, Salford on Thursday, 28 March, 1968, 140 members of the Division were entertained to luncheon by the North West Electricity Board and the Central Electricity Board. After lunch the members present heard Mr. Prior, Assistant Regional Director (Generation) of the Central Electricity Generating Board speak on "Nuclear Energy: Fuel of the Future".

The Divisional Council met on three occasions during the year, at the first meeting held at Leigh Town Hall in May, 1968, Miss N. Kenyon of the Women's Electrical Association was elected Chairman for a second term of office. Mr. Fred Winder, Chief Public Health Inspector of Stockport C.B.C. was elected Vice-Chairman of the Divisional Council. Mr. H. Clusky was elected Honary Treasurer and Mr. W. E. Pollit was elected Honorary Secretary.

The Divisional Council has during the year under review devoted a great deal of time in bringing the publicity campaign "Essay Competition" to a successful conclusion. A separate report was prepared to enable members to realize the size of the task undertaken. It was pleasing to note that the efforts of the North West Division in this field have attracted the attention of members of the National Executive.

Remarks on clean air progress made in last year's Annual Report have come to fruition, some of the smaller Local Authorities have completed their smoke control programme, many more are in the final stages while the efforts of the larger Local Authorities who have of course a much larger problem due to staffing difficulties and economic considerations are to be applauded. There are unfortunately still a few Local Authorities who have not made any real positive steps to control the insidious nuisance of smoke, the provisions of the Clean Air Act, 1968 it is hoped will encourage these Local Authorities to proceed. Failing this it is hoped that the Minister of Housing and Local Government will not only ask for a programme showing how these Local Authorities intend to proceed but will insist on immediate progress and in their default will use the powers given to him in Section 8 of the Clean Air Act, 1968. Assistance from the Ministry and the continued interest of all Local Authorities will finally defeat the enemies of clean air and provide a smoke free atmosphere which is the rightful heritage of every citizen.

The interest of schools and various Ladies' Guilds in the topic of clean air was again stimulated by speakers from the Division. The need for presenting the urgency of clean air to schools, colleges and universities is one which the Society should pursue. It would be a source of additional strength to the Society should these academic institutions be induced to join the fight for clean air.

The Chairman of the Divisional Council, Miss N. Kenyon thanks all members and officers of the Division for their continued assistance during two years during which she has been Chairman of the North West Divisional Council.

W. E. POLLITT, *Hon. Secretary*

Yorkshire Division

The Council of the Yorkshire Division of the National Society for Clean Air met on five occasions during the year. The Divisional Council met for a formal business meeting at the Parkway Hotel, Leeds on 27 February and in the afternoon an OPEN MEETING was held when a talk was given by Mr. H. G. Mitchell, M.SC., ENG., A.M.I.H.V.E., on "Total Environmental Control". This address gave details of modern research into ways of using waste heat from light, incidental heat gains etc., to provide comfort conditions. Mr. Mitchell illustrated his address with a considerable number of colour slides.

For the second meeting of the year the Council were the guests of British Railways, Leeds, on the 3 April when they heard a very interesting talk by Mr. T. Greaves, Traction Maintenance Engineer (Leeds Division). The talk which covered the history and development of British Rail and demonstrated the contribution that has been made to clean air, was illustrated by two films.

On the 10 May at the invitation of the directors of Universal Machinery & Services Ltd., the Council held a meeting at their works in Millshaw, Leeds. After the business meeting a technical talk on "Recent Developments in Smokeless Incineration" was given by Mr. R. Brett-Littlechild, Technical Director. Later, members were given a demonstration on three different sizes of incinerators capable of burning tyres, plastic and other materials smokelessly. It was not possible to make this another open meeting as accommodation was strictly limited.

A second OPEN MEETING at the Grimethorpe Works of Coalite and Chemical Products Ltd., was attended by 90 delegates on the 13 June. After a conducted tour of the manufacturing plant the delegates were entertained to lunch at the Kerrisforth Hall Country Club by Mr. Francis L. Waring, F.INST.F., the Managing Director of Coalite and Chemical Products. After lunch the meeting was addressed by Mr. C. E. Needham, General Manager, Carbonization and Fuels, on the "Production and Supply of Solid Smokeless Fuels".

Finally, on 2 December at the invitation of the National Carbonizing Co. Ltd., the Council met at the Midland Rexco Works at Ollerton to discuss a future programme of meetings. In the afternoon an OPEN MEETING was held at which 75 delegates were present to hear an address on "Progress in Coal Carbonization" by Mr. J. Kershaw, General Manager, National Carbonizing Co. Ltd., and were conducted round this modern plant.

Detailed reports of clean air progress have been submitted to the Divisional Council by Mr. F. H. Myers (Bradford), Mr. W. Jennings (Brighouse), Mr. A. W. Perry (Halifax), Mr. F. Ellam (Huddersfield), Mr. A. C. Saword (Kingston-upon-Hull), Mr. J. Goodfellow (Leeds), Mr. L. Eastwood (Rotherham), Mr. J. W. Batey (Sheffield) and Mr. N. Hancock (York).

The present membership in the Yorkshire Division is as follows:

	1968	1967
Individual members	31	30
Corporate or Institution members	18	16
Local Authority members	66	66
Associate members	6	7

The Divisional Display Stand is available on loan to any Local Authority in the Yorkshire Division for exhibition and publicity purposes. There is no charge for its use, the only stipulation being that it should be collected from and returned to Leeds, in good condition, by the user. (It is in two large wooden cases and a van is needed for transport). Enquiry should be made of the Honorary Secretary, at the Public Health Department, 12 Market Buildings, Vicar Lane, Leeds, LS1 7JG. (Tel. No: Leeds 30211).

The Divisional Council is open to receive suggestions and invitations from Members to visit places or institutions with a definite atmospheric pollution interest, bearing in mind the public opinion forming value of such meetings and visits.

JAMES GOODFELLOW, *Hon. Secretary*

West Midlands Division

The Divisional Council, in furtherance of its policy of holding meetings where papers of a technical and topical nature are presented to members, arranged two such meetings during 1968. The first meeting in April was held at Abbey House, Buildwas, by kind permission of the Central Electricity Generating Board and the Midlands Electricity Board, who also provided lunch for our members. Mr Arthur Hawkins, B.SC., Regional Director, Central Electricity Generating Board, addressed members on "Electricity Today" and he was followed by Mr. R. Mallett, Deputy Chairman, Midlands Electricity Board, who spoke on "The Contribution of Electricity to Clean Air". Members were then taken on a conducted tour of the two Ironbridge Generating Plants, returning by coach to Abbey House for tea, where the two Boards had arranged an excellent Clean Air Exhibition.

The second meeting was held at Shell-B.P. House, Birmingham, by courtesy of Shell-Mex & B.P. Ltd., who very kindly entertained members to lunch. Proceedings started at 11 a.m. with a welcome by Mr. R. Philliskirk, C.ENG., A.M.I.MECH.E., A.M.INST.F. This was followed by the film "Clean Air". Mr. E. B. Briggs, A.M.GAS ENG., A.M.INST.F., then spoke on Clean Air Legislation. After a spirited discussion on this paper, members were addressed by Mr. P. D. Lyons who ably dealt with problems arising from the operation of cupolas. In the afternoon there was a demonstration of Stack Solids Equipment given by Messrs. Lee and Rooney. This was of particular value in view of recent developments. Mr. Rooney then dealt with "Emissions from Chimneys", "Causes and Possible Remedies". After each paper there was a period allowed for discussion and questions which, in each case, proved to be too short, the Chairman having reluctantly to impose the closure.

These meetings by providing members with up-to-date information given by acknowledged experts are filling a very real need. They also provide useful contacts for local authority officers and are undoubtedly beneficial to all. In addition, they make for most excellent public relations; I am convinced that more is achieved by co-operation than coercion.

Matters discussed by the Divisional Council during the year included Stubble Burning; Grit and Dust Measurement and Clean Air Action Weeks. In this latter connection 34 questionnaires were sent out to local authorities, 24 replies were received, the results being as follows: In favour: 10; Against: 13; Consideration deferred: 1. Total: 24.

Due to the support so readily afforded to the Division by Warley Corporation, our expenses have been remarkably low. We are also indebted for the support given to us by industrialists. Since I have been Divisional Secretary no expense has been incurred in the hiring of halls for our general meetings, excellent hospitality being accorded us both by local authorities and industrialists. This to a voluntary organization such as ours is most welcome practical support.

W. L. KAY, *Hon. Secretary*

South East Division

Smoke control proved an easy target for some Local Authorities in response to the Government's call for the limitation on spending. Several Authorities in the Division have reduced their rate of progress although the overall effect is not as serious as it could have been. Those Authorities who have already completed their programmes, or carried out the major part of them before costs rose steeply and the financial crisis reached a really acute stage have every reason to congratulate themselves. Not only did they get the work done at minimum cost to householders and ratepayers but their action led to the remarkable reduction in pollution reported by Warren Springs Laboratory in the National Survey of the South East. The whole of the area covered by the report falls within the Division.

A fair level of activity was maintained in the Division. Five meetings of the Divisional Council were held with an average attendance of 12 out of a possible 23. Normally these meetings are held in central London but this year as an experiment, one was held at Grays, Essex, at the invitation of the Thurrock U.D.C. in conjunction with a visit to a cement works. The experiment was highly successful and worth repeating. A general meeting on the 28 February was addressed by the Deputy Chief Alkali Inspector on the subject of Grit and Dust. This followed closely on the publication of the report of the Working Party on this subject and created considerable interest. The meeting was fully reported in the Summer edition of *Smokeless Air*.

Following the formal business of the Annual General Meeting on the 7 November, Mr. R. S. Thornton, Ministry of Housing and Local Government, gave a talk on the new Clean Air Act. He dealt in detail with the new provisions in the Act and answered many questions. During the year four visits were held to places of special interest. The response of members to these visits was very poor but those who did attend were well rewarded. On the 11 June the Queen Mary Nucleonics Laboratory was visited. Members saw the 50KW Nuclear Research Reactor used on research projects on reactor behaviour. Members journeyed to the National Coal Board's Snowdown Colliery, Kent on the 3 July and went underground to the coal face, suffering one casualty in the process. In spite of the safety helmet provided, one member sustained a gash on his forehead through coming into contact with a projecting timber in the dimly lit "road". On the 31 July, leaving London nearly two hours late due to the non-arrival of the motor coach, members hurtled along the M1 to the Bolsover Plant of Coalite & Chemical Products Ltd. The Pimlico District Heating Scheme of the Westminster City Council was visited on 1 October. The grateful thanks of the Division are due to the organizations who gave permission for these visits and for the hospitality they provided, and also to their staffs, who made the necessary arrangements and conducted the parties round the places in question.

These activities were for the benefit and interest of existing members. Little or nothing was done to create interest where it did not already exist. Whilst the present time is obviously inopportune for trying to extend the scope of smoke control, this situation will not last for ever. Even when financial restrictions are eased further progress will be slow unless the essential preparatory work of education, publicity and propaganda has been carried out. It would seem that the future of this Society and the prospect of clean air throughout the Division would be enhanced by a re-appraisal of our efforts.

South West Division

The South West Divisional Council has met once during the current year, on 18 April 1968, when members gathered in the Housewarming Centre, Bristol, for the nomination of officers and the business of the

Division. At the Annual Meeting that followed 30 members signed the attendance book and heard a report on the Blackpool Conference and Exhibition and the meetings of the Society's Executive Council and Committees when special tribute was paid to the work of Mr. P. Draper.

Members of the Division travelled to Stoke Orchard National Coal Board Research Establishment in April 1968 for a most instructive and useful visit. Mr. Gordon Nelson, who led the party, expressed appreciation to the N.C.B. for both their hospitality and the amount of valuable research that had been shown to them.

G. J. CREECH, *Hon. Secretary*

East Midlands Division

Disappointment has been expressed in previous years of the comparatively slow progress being made in the expansion of smoke control areas in this Division, but it has been pleasing to see some signs of improvement in the position during this year. Some of those Local Authorities who previously have been disinclined to submit smoke control programmes have now been encouraged to do so, and there is every reason to hope that a more rapid expansion of smoke control throughout the Division will follow. The first of the three meetings held in the Division during the year was intended to stimulate the expansion of smoke control areas, and to demonstrate the advantages to be gained in areas of new development where district heating was practicable.

The National Coal Board kindly arranged a full-day meeting in Nottingham on the 14 March 1968 at their recently opened House Warming Centre in Maid Marion Way. Members were welcomed by B. H. V. Clark, Esq., Deputy Regional Marketing Director of the North Midlands Sales Region, who spoke of the value of House Warming Centres in the furtherance of clean air and of the assistance they could give to Local Authorities with their smoke control programmes. An illustrated talk entitled "The Application of Solid Smokeless Fuels in Smoke Control Areas", given by C. H. Perry, Esq., of the National Coal Board, followed.

A film was shown of the Rowlatts Hill Leicester District Heating Scheme where 507 housing units are provided with full central heating and domestic hot water supply from a central boiler house. Members were then taken on a conducted tour of the House Warming Centre and inspected the fully automatic solid fuel heating system serving the Block. They were then entertained to a buffet lunch by kind invitation of the National Coal Board.

The afternoon session was devoted to a visit to the Hyson Green Development of the City of Nottingham where 593 dwellings comprising 471 maisonettes and 122 flats are heated from a central source by the N.C.B. under contract to the Nottingham Corporation.

Afterwards tea was provided by the N.C.B., at which the Chairman, Mr. J. F. Edwards expressed the thanks of the 68 members present to the National Coal Board.

The Annual General Meeting was held in Cambridge on the 11 July 1968, 58 members braving very bad weather conditions and flooded roads to be present at the meeting. An official welcome was given by Alderman C. E. Ridgeon on behalf of the Cambridge City Council who expressed particular pleasure that the meeting was being held in Cambridge, as the Chairman of the Division, Mr. J. F. Edwards was their Chief Public Health Inspector, an official who was held in high regard. The Chairman welcomed and introduced Rear Admiral P. G. Sharp, C.B., D.S.C., the new Director, and voiced the pleasure of all present that he had been able to visit the East Midlands Division so early after taking Office.

Following the business of the meeting, an address entitled "Domestic Oil Fired Heating and the Clean Air Act" was given by P. F. Heitzman, Esq., of the Domestic Technical Services of Shell-Mex and B.P. Ltd. The talk was illustrated by slides showing various systems in which oil can be used for both small and large central heating systems. An interesting discussion followed in which the speaker ably dealt with the many questions raised. The Chairman expressed thanks to the Speaker and Cambridge City Council for the excellent arrangements and hospitality provided.

The increasing contribution being made by the internal combustion engine to the pollution of the atmosphere has been the concern of this Society and other National Bodies in recent years. The East Midland Division was, therefore, very pleased to accept an invitation from the Peterborough City Council, and Messrs. Perkins Engines Ltd., the largest manufacturers of diesel engines in the world, to visit Peterborough on the 29 October 1968 to discuss the theoretical and practical problems associated with this type of pollution. This meeting and visit was described in the Spring 1969 issue of *Smokeless Air*.

G. W. DRABBLE, *Hon. Secretary*

South Wales

On 24 September, the South Wales Division met at Berkeley Atomic Power Station, Gloucestershire and were welcomed by Mr. McFarland, Manager South Wales and Western Region Central Electricity Generating Board. Following coffee, the members were addressed by Rear Admiral P. G. Sharp, C.B., D.S.C., the Director of the Society.

The members, after being entertained to lunch, were given a short talk on Atomic Power and then toured the Station. Question time followed, which proved to be of much interest to everyone present. The meeting concluded following tea.

The Division's thanks were conveyed to Mr. McFarland and Mr. Tudor Thomas, Station Superintendent.

L. MORGAN, *Hon. Secretary*

Information About the Society

The forerunners of the Society were the Coal Smoke Abatement Society, established in London in 1899, the Smoke Abatement League of Great Britain (1909) concerned mainly with the Provinces, and the National Smoke Abatement Society, formed in 1929 by the amalgamation of the two parent organizations. At a Special General Meeting held in April 1957, it was agreed unanimously to change the name of the Society to "National Society for Clean Air", and to seek incorporation as a company limited by guarantee, a licence being sought from the Board of Trade to omit the word limited. The Society assumed its new name and status as from 1st January, 1958. For further information about membership, Executive Council and Committees, etc., reference should be made to the Society's Memorandum and Articles of Association and Byelaws.

Divisions

For electoral purposes and where it is desired, area organization, the Society is now composed of the following geographical Divisions: (1) Scotland, (2) Northern Ireland, (3) North West, (4) North East, (5) Yorkshire, (6) West Midlands, (7) East Midlands, (8) South West, (9) South East, (10) South Wales and Monmouthshire. (See Byelaws for the Counties in each Division).

Membership

The Society is wholly dependent on the contributions of its members for the growth and the maintenance of its work, and invites the support of all who sympathize with and wish to promote its objects. These are stated in full in the Memorandum of Association, but they may be briefly summarized as the securing throughout the United Kingdom of the maximum of natural light and air free from every form of pollution, particularly that arising from the combustion of fuel. There are three main classes of membership—for individuals, local authorities, and corporate bodies such as firms, public undertakings and institutions. Individual members and the representatives of other members have rights of nomination and voting in elections for Officers and Council. They receive, free of charge, the Society's quarterly journal *Smokeless Air* and other publications. Local authority and corporate full members are also entitled to receive one *extra* copy of *Smokeless Air* and the Society's Year Book for each guinea by which their subscription exceeds three guineas. Corporate members who have branches or offices in Divisions of the Society other than that in which their Registered Office is situated may appoint Delegates to participate in the activities of those Divisions. Members are entitled to receive assistance and information on problems relating to air pollution. In addition to receiving notices of meetings and conferences organized nationally, they are entitled to participate in any activities organized by or within their Division.

Associates

Any individual, local authority, institution or corporate body contributing less than the appropriate membership subscription may become an *Associate*, entitled to some of the privileges of membership, but not to those relating to nomination, voting and election to office.

Subscriptions

Individual Members—Not less than one pound ten shillings.

Local Authority Members—Not less than the following amounts, according to population:

	£
Less than 25,000	8
25,001 to 50,000	10
50,001 to 75,000	13
75,001 to 100,000	19
100,001 to 175,000	32
175,001 to 250,000	35
250,001 to 375,000	40
375,001 to 500,000	45
500,001 and over	60

Corporate Members—Not less than thirty pounds (two representatives and two delegates in each appropriate Division), or not less than eighteen pounds (one representative and one delegate in each appropriate Division).

(Under Article 5 (e) (ii) of the Society's Articles of Association, an Association or firm which is not incorporated can appoint representatives to act on its behalf, and obtain all the benefits of Corporate Membership.)

SUSTAINING MEMBERS—A Member in any class subscribing not less than £100 a year. (See list page 84.)

SPECIAL CASES—The Executive Council may consider applications for membership on special terms as to subscriptions and otherwise. This rule is intended to apply in particular to local and other small voluntary associations wishing to become Corporate Members.

ASSOCIATES—Any sum that is less than the appropriate subscription for membership.

DONATIONS—The Society will be pleased to receive single or annual donations for any amounts from non-members.

PUBLICATIONS—Annual subscriptions may be made for *Smokeless Air*, *Clean Air Year Book* and for other publications as issued. Details of such subscriptions will be sent on request.

PAYMENT OF SUBSCRIPTIONS—The first subscription should be forwarded with application for membership. This may be sent at any time. It is mutually advantageous if subscriptions are made by Banker's Order.

COVENANT DONATIONS—Annual contributions to the Society may be made under covenant, the Society being recognized as a "charity" by the Commissioners of Inland Revenue for this purpose. By signing an agreement to subscribe a stated sum for a period of at least seven years the Society may claim the amount of income tax that has been paid on such contributions, thereby increasing the benefit it receives without additional cost to the donor. Further particulars and form of covenant will be forwarded on request.

Representatives and Delegates

Local authority and Corporate Members are entitled to appoint Representatives to exercise on their behalf the rights of membership with regard to nomination for office, voting, receipt of publications, etc. Corporate Members may appoint one or two representatives each, according to subscription, and Local Authority Members a number according to population, as follows:

Less than 100,000	2
100,001 to 250,000	3
250,001 to 500,000	4
500,001 and over	5

Note: The Delegates mentioned previously participate in the activities of the Society *only* at Divisional level. A member's Representative exercises all the rights to which a member is entitled.

The names and addresses of Representatives should be forwarded on making application for membership, so that they may be entered in the Voting Registers.

Services to Members

Information and Advice

Advice, assistance and information on matters relating to atmospheric pollution and its prevention is available free of charge to Members, provided that, where necessary, the request is approved by the Executive Council. If the information required is not immediately available to the Society's Information Department, the Society is prepared, on behalf of a Member, to obtain it from one of the specialized Information Bureaux.

Library

The Society's Library is available for the use of all Members. It possesses classified files of Press cuttings, and an extensive collection of both British and foreign books, reports and pamphlets on air pollution and related subjects. In some cases, the Society is the only organization in the United Kingdom receiving the publication. Books and other publications are issued on loan, or may be consulted in the Society's offices. The Society is linked with various specialist and technical libraries, and when a publication relating to some special aspect of air pollution is not in the library, the Society can often borrow it through other sources. Applications should be made initially to the Librarian.

Lectures

The Society will be pleased to help members and others in any part of the country to arrange lectures and talks of all kinds on atmospheric pollution and related subjects. A panel of speakers, arranged regionally, is being prepared and will be supplied on request.

Films

The Society does not possess films or film strips for loan, but a comprehensive list of films available from other sources is given elsewhere in this Year Book.

Exhibitions

The Society is prepared to consider participating in suitable exhibitions, and has a mobile modular exhibition stand available for this purpose.

Publicity Advisory Service

The Society's Publicity Advisory Service is available to help Local Authorities and Corporate Members with their Clean Air Publicity, especially when Smoke Control Orders are pending.

The Service advises members on display material, its arrangement for exhibitions, stands, etc., and supplies information on other publicity activities such as public meetings, local press features and correspondence, educational work in schools, women's organizations, etc.

No charge is made for this service to members.

Exhibition Display Material

The Society has several exhibition units available for loan by local authorities and corporate members. These units are adaptable for displays ranging from 20 sq. ft. to 300 sq. ft. of floor space, and are complete with their own graphics and lighting.

Demand for these units is heavy particularly in the spring and autumn, and it is essential that enquiries are made as far in advance as possible.

No charge is made for the loan of these units other than the cost of carriage.

In addition the following framed information panels under perspex are available:

I.P. 1—I.P. 4, Death in a London Fog, Why have soot with your custard? (Attack on Plant Life, and Holiday Resort), the following new framed panels under perspex are now available: (Size 30ins. x 20ins. except where stated.)

I.P.6 *Smoke Damages Stonework*—Illustrations of St. Paul's Cathedral before and after cleaning.

I.P.7 *Smoke Harms the Countryside*—Illustrations of the effect of pollution on vegetation.

I.P.8 *Smoke is Injurious to Health.*—Illustrations of clean and dirty lungs.

I.P.9 *Pollution from Road Vehicles*—Illustrations of the menace created by both petrol- and diesel-engined vehicles.

I.P.10 *Pollution from Industry*—Contrasting pictures of smoke-producing factory chimneys and a model, no-smoke industrial plant.

I.P.11 *The Problem of Sulphur Dioxide*—Photographs show the effect of SO_2 on iron railings and on leather-bound books (illustrated above).

I.P.12 *Smokeless Zones Mean Cleaner Air*—Contrasting pictures of a city in a Black area with a new housing estate in a smoke-controlled area.

Posters

The Society has a number of coloured and line posters available, ranging in price from 1s. 9d. per copy (double crown) to £7 10s. per 100 copies (with a reduction for Members). Crown line posters cost 8d. per copy to £2 8s. for 100 copies.

The full list of posters available is as follows:

2. *Clean Air is Your Affair*

4. *Prevent Air Pollution—Britain's Biggest Headache*

5. *Smokeless Zones—Cleaner Homes*

6. *Away with Smoke—Let in the Light*

9. *These are the Things that Smoke Does.*

10/11. *For Clean Air*—Posters designed for local overprinting (Double Crown and Crown sizes available).

Wall Chart

For school use. 44 ins. x 25 ins. (2s. including Lecture Notes.) From Educational Productions Ltd., 17 Denbigh Street, London, S.W.1.

Literature

Inquiries are invited on the supply of publications, give-away leaflets, etc., for special purposes. Particulars of these are given below and also in the Society's "Guide to Publications", on another page.

(1) "Descriptive Summary of the Clean Air Act." 6d. per single copy (by post 8d.) 4s. 6d. per dozen, or £1 10s. per 100.

(2) "Clean Air Begins at Home". 15s. per 100, or £6 per 1,000.

(3) "Smoke Affects Your Health & Your Wealth." 15s. per 100, or £6 per 1,000.

(4) Clean Air Bookmarks—4s. per 100, 30s. per 1,000.

(5) Clean Air: Notes for Teachers and Lecturers. 1s. 6d. (1·10) per copy 15s. 6d. per dozen.

(6) Fumifugium 2s. 6d. (3s.).

(7) Sulphur Dioxide 2s. (2s. 6d.).

(8) Air Pollution from Road Vehicles 3s. (3s. 6d.).

Photographs

The Society has a classified and indexed collection of smoke and other photographs, which are suitable for reproduction and/or exhibition purposes.

New photographs of high pictorial quality, in colour and covering a wide range of air pollution control subjects have now been acquired by the Society. Prints may be inspected at the Society's offices, or a selection will be sent by post if details of requirements are given. The copyright in the photographs is retained by the photographer, and where reproduction fees are chargeable, the inquirer should communicate with the photographer.

Summary of Divisional Accounts
For the year ended 31 December, 1968

Division	*Balance as at 1 January, 1968*			*Grants*			*Other Income*			*Expenditure*			*Balance as at 31 December, 1968*		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Scotland	180	0	6	100	0	0	192	3	8	339	0	11	133	3	3
Northern Ireland ..	24	6	10	30	0	0	8	3	6	16	7	9	46	2	7
North West	35	2	8	120	0	0	182	0	0	266	18	11	70	3	9
North East	27	17	1	30	0	0		19	5	19	2	5	39	14	1
Yorkshire	50	4	10	40	0	0		—		60	9	6	29	15	4
West Midlands	150	4	8	65	0	0		—		43	18	1	171	6	7
East Midlands	38	2	3	60	0	0		—		33	19	0	64	3	3
South West	59	3	11	50	0	0		—			—		109	3	11
South East	21	8	2	100	0	0	10	10	0	78	12	1	53	6	1
South Wales & Mon. ..	77	11	8	28	12	6		—		8	2	0	98	2	2
Totals ..	664	2	7	623	12	6	393	16	7	866	10	8	815	1	0

NATIONAL SOCIETY FOR CLEAN AIR

(Limited by Guarantee—Incorporated 1 January, 1958)
Balance Sheet as at 31 December, 1968

1967 £		£	£
	GENERAL FUND		
20,087	Balance at 1st January, 1968	18,766	
1,321	*Less:* Deficit for the year	1,040	
18,766			17,726
	PREMISES RESERVE FUND		
4,667	Balance at 1st January, 1968		4,667
	JOHN STANLEY SEVERS LEGACY FUND		
2,187	Balance at 1st January, 1968	1,187	
1,000	*Less:* Transfer to Information and Publicity Services Account	1,000	
1,187			187
24,620			22,580
	CURRENT LIABILITIES		
2,144	Sundry Creditors and Accrued Expenses	2,065	
—	Bank Overdraft	408	
2,144			2,473
£26,764			£25,053

1967 £		£	£
	FIXED ASSETS		
—	Office Equipment and Furniture *Note:* Records are not available to show the original cost price.		Not Valued
	INVESTMENTS AT COST		
4,149	Government and Corporation Stocks	4,149	
3,270	Other Fixed Interest Stocks	3,270	
13,644	Ordinary Shares	13,643	
21,063			21,062
	(Market Value 31.12.1967, £23,754) (Market Value 31.12.1968, £30,292)		
	CURRENT ASSETS		
385	Stock of Posters, Charts, etc., at valuation	240	
3,915	Sundry Debtors and Prepayments	3,333	
843	Bank Balance—Deposit Account	363	
453	—Current Account	—	
105	Cash in Hand	55	
5,701			3,991
£26,764			£25,053

STANLEY E. COHEN, *Honorary Treasurer*
P. G. SHARP, *Director and Secretary*

REPORT OF THE HONORARY AUDITORS TO THE MEMBERS OF THE NATIONAL SOCIETY FOR CLEAN AIR

We have examined the above Balance Sheet and annexed Income and Expenditure Account. In our opinion the accounts comply with the Companies Acts, 1948 and 1967 and give a true and fair view of the state of the Company's affairs at 31st December, 1968 and of its deficit for the year ended on that date.

GEO. LITTLE, SEBIRE & CO., *Chartered Accountants*,

Income and Expenditure Account for the year ended 31 December, 1968

1967 £	EXPENDITURE	£	£
11,697	Salaries and Wages	14,330	
2,078	Staff Pension Scheme	521	
2,029	Rent, Rates, Light and Heat	2,081	
2,891	Travelling, Insurance, Cleaning and General Expenses	2,873	
427	Office Equipment and Furniture	357	
606	Stationery and Supplies	722	
19,728			20,884
	Smokeless Air and *Year Book:*		
3,569	Printing, Postage, etc	4,049	
2,964	*Less:* Receipts from Advertising	3,835	
605			214
	Information and Publicity Services and Cost of Publications	1,888	
2,058			
1,000	*Less:* Amount Paid from John Stanley Severs Legacy	1,000	
1,058			888
700	Divisional Grants		624
255	Loss on Sale of Investments		—
£22,346			£22,610

1967 £	INCOME	£	£
14,746	Subscriptions and Donations		16,590
4,601	Conference Fees	4,483	
3,875	*Less:* Expenses	3,236	
726			1,247
6,185	Exhibition Income	8,393	
4,035	*Less:* Expenses	7,189	
2,150			1,204
2,009	Sales of Publications		1,127
	INVESTMENT INCOME		
1,021	Taxed Dividends (Net)	1,042	
304	Income Tax Repayment	340	
69	Bank Deposit Interest	20	
1,394			1,402
£21,025			21,570
	EXCESS OF EXPENDITURE OVER INCOME		
1,321	Transferred to General Fund		1,040
£22,346			£22,610

Subscriptions & Donations

for the year ended 31 December, 1968

* Denotes Covenant Donor

(2) Denotes two Subscriptions received during the year

Scottish Division

	£	s.	d.
Aberdeen Corporation	26	5	0
Airdrie Corporation	8	8	0
Ayr County Council	5	0	0
Ayr Corporation (2)	6	6	0
*Barclay-Smith, Lt. Col. E. A.	1	1	0
Barrhead Corporation	6	6	0
Bradley, Mr. R. M.	1	1	0
Broadbent, Mr. J.	2	0	0
Christie, Mr. J. H.	1	1	0
Clackmanan County Council	8	8	0
Clydebank Corporation	10	10	0
Coatbridge Corporation	10	10	0
Cooper, Mr. F. T.	1	1	0
Dumbarton Corporation	6	6	0
Dumfries Corporation	8	8	0
Dunbarton County Council	26	5	0
Dundee Corporation	26	5	0
Dunfermline Corporation (2)	16	16	0
East Kilbride Development Corpn.	7	7	0
East Kilbride Corporation	8	8	0
Edinburgh Corporation	37	16	0
Falkirk Corporation	8	8	0
Fife County Council	26	5	0
Francis, Mr. S. H.	1	1	0
Gibb, Dr. W.	1	1	0
Glasgow Corporation	50	8	0
Grangemouth Corporation	6	6	0
Grattidge, Mr. H. H.	1	1	0
Hamilton Corporation	4	4	0
Hawick Corporation	6	6	0
*Horne, Dr. W. A.	2	2	0
Howden, James & Co. Ltd.	26	5	0
Innes, Mr. J.	1	1	0
Inverness County Council	10	10	0
Inverness Corporation	8	8	0
Irvine Corporation	6	6	0
Irvine, Mr. J. H.	1	1	0
Johnstone Corporation	6	6	0
Kilmarnock Corporation	8	8	0
Kilsyth Corporation	6	6	0
Kirkcaldy Corporation	10	10	0
Kirkintilloch Corporation	6	6	0
Lanark County Council	37	16	0
Laurie, Mr. G.		5	0
MacPherson, Mr. I.	1	1	0
Motherwell & Wishaw Corporation	10	10	0
Moule, Mr. J. W.	1	10	0
North of Scotland Hydro-Electric Board	15	15	0
Paisley Corporation	15	15	0
Perth Corporation	8	8	0
Perth County Council	3	3	0
Port Glasgow Corporation (2)	6	6	0
Renfrew Corporation	6	6	0
Renfrew County Council	12	12	0
*Ritchie, Mr. G. B.	1	1	0
Royal Sanitary Assoc. of Scotland	15	15	0
Rutherglen Corporation	6	6	0
Scottish Gas Board (2)	373	10	0
Slimming, Mr. D. W.	1	5	0
Smith & Wellstood Ltd.	1	1	0
Snodgrass, Mr. G. A.	1	1	0
South of Scotland Electricity Board	60	0	0
Stirling County Council	26	5	0
Stirling Corporation	8	8	0
Strump, Mr. G.		10	6
Waldie & Cameron Ltd.	1	1	0
Wallace, Mrs.		15	0
West Lothian County Council	8	8	0

Northern Ireland Division

	£	s.	d.
Antrim County Council	5	5	0
Antrim R.D.C.	8	8	0
Ballymena Corporation	6	6	0
Belfast Corporation	37	16	0
Carey, Dr. G. C. R.	1	1	0
Carrickfergus Corporation	6	6	0
Castlereagh R.D.C.	8	8	0
Coal Advisory Service	15	15	0
Davidson & Co. Ltd.	15	15	0
Dunbar, Mr. H.	1	1	0
Edward, Dr. M. D.	1	1	0
Electricity Board for Northern Ireland	15	15	0
*Ellison, Mr. C. A.	1	10	0
Guiness, Arthur Son & Co. Ltd.	15	15	0
Heywood, Mr. T. H.	1	11	0
Hinchliffe, Mr. D.	1	1	0
Jenkins, Major W.	1	1	0
Londonderry Corporation	10	10	0
Lynas, Mr. K. H.	1	10	0
Magee, Mr. J. L.	1	1	0
McAlery, Cllr. Miss I. M. E.	1	1	0
Millar, Mr. J.	1	1	0
Muske, Mr. W. J.	1	1	0
Northern Ireland Electrical Development Association	15	15	0
O'Brien, Mr. W. E. C.	1	5	0
Ormeau Bakery Ltd.	15	15	0
Peel, Mr. R.	1	1	0
Portadown Corporation	6	6	0
Porter, Col. H. J.	2	2	0
Reynolds, Mr. A.	1	10	0

North West Division

	£	s.	d.
Abram U.D.C.	6	6	0
Accrington Corporation	8	8	0
Altrincham Corporation	8	8	0
Amende, Mr. H. F.	1	0	0
Anonymous	20	0	0
Ashton in Makerfield U.D.C.	6	6	0
Ashton under Lyne	10	10	0
Atherton U.D.C.	6	6	0
Audenshaw U.D.C.	6	6	0
Bacup Corporation	6	6	0
Barrow in Furness Corporation	10	10	0
Bayes, Ald. Mrs. M.	3	0	0
*Beard, Mr. E.	2	17	0
Beattie Ltd., Messrs. E. & F.	1	1	0
Bebington Corporation	10	10	0
Behrens, Mr. A.		10	0
Bibby, Mr. H. P.	2	2	0

Birkenhead Corporation	2	2	0
Blackpool Corporation	26	5	0
Bolton Corporation	26	5	0
Bootle Corporation	12	12	0
Bredbury & Romiley U.D.C.	6	6	0
Brierfield U.D.C.	6	6	0
British Insulated Callender's Cables Ltd.	26	5	0
*Brown, Mr. P. S.	1	1	0
Bucklow R.D.C.	6	6	0
Burnley Corporation	15	15	0
Bury Corporation	10	10	0
Buxton Corporation	6	6	0
Cass, Mr. H. V.	1	1	0
Chadderton U.D.C.	8	8	0
*Chantler, Mr. P.	4	4	0
Cheadle & Gatley U.D.C.	8	8	0
Chester R.D.C.	8	8	0
Chorley Corporation	8	8	0
Christian, Mr. F. V. (2)	2	2	0
Church U.D.C.	6	6	0
Clitheroe Corporation	3	3	0
Clusky, Mr. H.	1	1	0
Coal Merchants' Federation of Great Britain	26	5	0
Colne Corporation	6	6	0
Community Council of Lancashire	2	2	0
Connah's Quay U.D.C.	6	6	0
Cooper, Miss I.	1	1	0
Crewe Corporation	10	10	0
Crompton U.D.C.	6	6	0
Crosby Corporation	3	3	0
Cumberland County Council	5	0	0
Darwen Corporation	8	8	0
Dearden, Mr. & Mrs. J.	3	0	0
Denton U.D.C.	8	8	0
Duguid, Mr. S.	2	2	0
Duguid, Mrs. S. N.	1	1	0
Dunkinfield Corporation	6	6	0
Eccles Corporation	8	8	0
Ellesmere Port Corporation	8	8	0
Failsworth U.D.C.	6	6	0
Fallows, Mr. W. B.	1	1	0
Farquharson, Mr. G. W.	1	1	0
Federation of Owner Occupiers and Owner Residents' Association Ltd.	3	3	0
Ferranti Ltd.	15	15	0
Fleetwood Corporation	8	8	0
Forsyth, Mrs. L. A.	1	1	0
Franklin, Mr. E. J.	1	1	0
Franklin, Mr. N. J.	1	1	0
Fulwood U.D.C.	6	6	0
Furness District Federation of Owner Occupiers' Association	2	2	0
Gee, Mr. J.	1	1	0
Gee, Mrs. J.	1	1	0
Glossop Corporation	6	6	0
Golbourne U.D.C.	6	6	0
Graham, Mrs. E. M.	1	1	0
*Graham, Mr. G. M.	1	0	0
Great Harwood U.D.C.	6	6	0
Hale U.D.C.	6	6	0
Hall, Mr. A.	1	10	0
Hall, Mr. E. N.	1	1	0
Halliday, Mr. A. C.	1	10	0
Hallows, Mr. V. K.	1	1	0
Haslingden Corporation	6	6	0
Haydock U.D.C.	6	6	0
*Hayhurst, Mr. H.	1	1	0
Hazel Grove & Bramhall U.D.C.	6	6	0
*Heald, Dr. G. E.	1	1	0
Hendy, Dr. B.	1	1	0
Heywood Corporation	8	8	0
Hindley U.D.C.	6	6	0
Horwich U.D.C.	6	6	0
Howe, Mr. A. J.	1	1	0
Hoylake U.D.C.	5	5	0
Huyton with Roby U.D.C.	10	10	0
Hyde Corporation	8	8	0
Ince in Makerfield U.D.C.	6	6	0
Irlam U.D.C.	6	6	0
Jackson, Mr. C. L.	1	1	0
John Summers & Sons Ltd.	26	5	0
Kearsley U.D.C.	6	6	0
*Keddie, Dr. J. T. C.	1	1	0
Kenyon, Miss N.	1	1	0
Kerr, Mr. J.	3	3	0
Kirk, Mr. W. R.	1	1	0
Kirkby U.D.C.	10	10	0
Kitchener, The Rt. Hon. The Earl	1	0	0
Knight, Mr. R. F.	1	1	0
Lancashire County Council	52	10	0
Lancashire & District Coke Distributors' Association	26	5	0
Lancaster Corporation	8	8	0
Lane, Mrs. W.	1	1	0
Langford, Mr. A. S.		10	6
*Leech, Dr. P. W.	1	1	0
Lees, Miss M.	1	1	0
Leigh Corporation	8	8	0
Leyland U.D.C.	6	6	0
Littleborough U.D.C.	6	6	0
Liverpool Corporation	50	8	0
Longendale U.D.C.	6	6	0
MacWilliam, Dr. H. H.		15	0
Macclesfield Corporation	8	8	0
Manchester Corporation	50	8	0
Manchester & District Regional Clean Air Council	15	15	0
Marple U.D.C.	6	6	0
Mather & Platt Ltd.	100	0	0
*Mather, Sir William	1	0	0
Matlock U.D.C.	6	6	0
Mercer & Sons Ltd.	1	1	0
Merseyside & North Wales Electricity Board	59	0	0
Middleton Corporation	10	10	0
Mitchell, Mr. L. A.	1	1	0
Morecambe & Heysham Corporation	8	8	0
Nelson Corporation	8	8	0
Newton le Willows U.D.C.	6	6	0
North Western Electricity Board	89	0	0
North Western Gas Board	200	0	0
Northwich R.D.C.	8	8	0
Northwich U.D.C.	6	6	0
*Norwood, Mrs. D. B.	1	1	0
Oldham Corporation	26	5	0
Ormskirk U.D.C.	6	6	0
Padiham U.D.C.	6	6	0
Pennington, Mr. H.	1	1	0
Pike, Miss I. M.	1	1	0
Polding, Mr. W. W.		10	6
Pollitt, Mr. W. E.	1	1	0
Preston Corporation (2)	52	10	0
Preston R.D.C.	8	8	0
Prestwich Corporation	8	8	0
Radcliffe Corporation	8	8	0
Rae, Cllr. K. F.	1	1	0
Ramsbottom U.D.C.	6	6	0
Rawtenstall Corporation	8	8	0
Refuge Assurance Co. Ltd.	12	12	0
Rhyl U.D.C.	6	6	0
Richards, Mr. J. E.	1	1	0
Riston U.D.C.	2	2	0
Rochdale Corporation	15	15	0
Royton U.D.C.	6	6	0
Runcorn R.D.C.	8	8	0
Runcorn U.D.C.	8	8	0
Sale Corporation	8	8	0
Salford Corporation	26	5	0
Shaw, Mrs. M.	1	1	0
Simon Carves Ltd.	200	0	0
Skelmersdale & Holland U.D.C.	12	12	0
Southport Corporation	1	1	0
Stalybridge Corporation	6	6	0
Standish with Langtree U.D.C.	6	6	0
Stanyard, Mr. R. J.	1	1	0
Stockport Corporation	26	5	0
Stretford Corporation	21	0	0
Stringer, Mr. F. W.	1	10	0
Swinton & Pendlebury Corporation	8	8	0
Taylor, Mrs. A. E.	1	1	0
Taylor, Mr. A.	1	1	0
Taylor, Mrs. E.	1	1	0
Taylor, Mr. S.	1	1	0
Taymar Ltd.	2	2	0

Thomas, Mr. F. L.	1	1	0
Thornton Cleveleys U.D.C.	5	5	0
Thorpe, Mr. J. A.	1	1	0
Tillotsons Newspapers Ltd.	5	5	0
Tintwistle R.D.C.	2	2	0
Topham, Mrs. D. A.	1	1	0
Tyldesley U.D.C.	6	6	0
*Vanstone, Mr. H. B.	1	16	0
Viney, Mr. N. H.	1	1	0
Wallasey Corporation	26	5	0
Ward, Mr. A. G.	1	1	0
Warren, Mr. D.	1	1	0
Warrington Local Medical Committee	2	2	0
Warrington R.D.C.	5	5	0
Whiston R.D.C.	8	8	0
Whitefield U.D.C.	6	6	0
Whitworth U.D.C.	6	6	0
Widnes Corporation	10	10	0
Wigan Corporation	15	15	0
Williams, Mr. W. B.	1	0	0
Williamson, Mr. J. G.		15	0
Wilmslow U.D.C.	6	6	0
Winsford U.D.C.	8	8	0
Wood, Mrs. C.	1	1	0
Workington Corporation	8	8	0
Worsley U.D.C.	8	8	0
Wrexham Corporation	8	8	0
Wrexham R.D.C.	10	10	0

North East Division

	£	s.	d.
American Air Filter (G.B.) Ltd. (2)	31	10	0
*Angus, Col. E. G.	3	3	0
Ashington U.D.C.	8	8	0
*Atkinson, Mr. E.	1	13	0
Atkinson, Mr. H.		15	0
Barnard Castle R.D.C.	6	6	0
Bedlingtonshire U.D.C.	8	8	0
Bishop Auckland U.D.C.	8	8	0
Blaydon U.D.C.	8	8	0
Boldon U.D.C.	6	6	0
Brandon & Byshottles U.D.C.	6	6	0
*Calvert, Mrs. M. R.	1	10	0
Carr, Mr. W.	1	1	0
Castle Ward R.D.C.	6	6	0
Chambers, Mr. A.	1	1	0
Chester le Street R.D.C.	8	8	0
Chester le Street U.D.C.	6	6	0
Consett U.D.C.	8	8	0
Crook & Willington U.D.C.	8	8	0
Darlington Corporation	7	7	0
Dorman Long & Co. Ltd.	15	15	0
Felling U.D.C.	8	8	0
Gateshead Corporation	26	5	0
Gosforth U.D.C.	6	6	0
Hartlepool Corporation	15	15	0
Head Wrightson Iron & Steel Works Eng. Ltd.	26	5	0
Hebburn U.D.C.	6	6	0
Hetton U.D.C. (2)	12	12	0
Houghton le Spring	8	8	0
Imperial Chemical Industries Ltd. (Agricultural Division)	15	15	0
*Isaac, Prof. P. C. G.	2	0	0
Jarrow Corporation	8	8	0
Lanchester R.D.C.	6	6	0
Morpeth Corporation	6	6	0
Mullen, Mr. A. J.	1	1	0
Newburn U.D.C.	8	8	0
Newcastle Regional Hospital Board	15	15	0
Newcastle upon Tyne Corporation	37	16	0
Nisbet, Mr. R. F.	1	1	0
Northumberland County Council	37	16	0
North Eastern Electricity Board	52	0	0
Northern Coke Distributors' Assoc.	15	15	0
Northern Gas Board	100	0	0
*Ogilvie, Dr. A. G.	1	1	0
Prudhoe U.D.C.	6	6	0
Redcar Corporation	8	8	0
Ryton U.D.C.	6	6	0
Sedgefield R.D.C.	8	8	0
Shildon U.D.C.	6	6	0
Skelton & Brotton U.D.C.	6	6	0
Smith, Mr. R. D.	1	1	0
South Shields Corporation	26	5	0
Spennymoor U.D.C.	6	6	0
*Spriggs, Dr. E. A.	1	1	0
Stanley U.D.C.	8	8	0
Sunderland Corporation	26	5	0
Thomas, Mr. D. M. C.	1	1	0
Teesside Corporation	37	16	0
Tynemouth Corporation	10	10	0
University of Newcastle upon Tyne	3	3	0
Wallsend Corporation	8	8	0
Washington U.D.C.	6	6	0
Whickham U.D.C.	6	6	0
Whitley Bay Corporation	8	8	0
Yarrow, Mr. C.	1	1	0

Yorkshire Division

Adwick le Street U.D.C.	6	6	0
Aireborough U.D.C.	8	8	0
Armitage, Mr. F.	1	1	0
Barnsley District Coking Co. Ltd.	31	10	0
Batley Corporation	8	8	0
Bentley with Arksey U.D.C.	6	6	0
Bingley U.D.C.	6	6	0
Boyd, Miss A. D.	1	1	0
Bradford Corporation	37	16	0
Bridlington Corporation	8	8	0
Brighouse Corporation	8	8	0
Brown, Mr. G. L.	2	2	0
Castleford Corporation	8	8	0
Chambers, Mr. C. A.	1	1	0
Clayton Son & Co. Ltd.	2	2	0
Coke Oven Manager's Association	5	5	0
Colne Valley U.D.C.	6	6	0
Cudworth U.D.C.	6	6	0
Darton U.D.C.	6	6	0
Dearne U.D.C.	6	6	0
Denby Dale U.D.C.	6	6	0
Dewsbury Corporation	10	10	0
Doncaster Corporation	15	15	0
Doncaster R.D.C.	10	10	0
Elland U.D.C.	6	6	0
Etherington, Mr. H.	1	1	0
Fleming, Mr. I.	1	1	0
Gifford, Dr. P. W. W.	1	1	0
Goodfellow, Mr. J.	1	1	0
Griffiths, Mr. D. P.	1	1	0
Hackney, Mr. E. S.	1	1	0
Halifax Corporation	15	15	0
Harrogate Corporation	10	10	0
Heckmondwike U.D.C.	6	6	0
Hemsworth R.D.C.	10	10	0
Hemsworth U.D.C.	6	6	0
Hepton R.D.C.	6	6	0
Holms, W. C. & Co. Ltd.	26	5	0
Holmfirth U.D.C.	6	6	0
Horbury U.D.C. (2)	12	12	0
Horsforth U.D.C.	6	6	0
Hoyland Nether U.D.C.	6	6	0
Huddersfield Corporation	26	5	0
*Hutton, Dr. K. B.	15	0	0
Ilkley U.D.C.	6	6	0
Jackson, Dr. Mary	1	1	0
Jervis, Dr. J. J.	1	1	0
John Thurley Ltd.	26	5	0
Jones, Mr. L.	1	1	0
Jordan, Mr. H. H.	1	1	0
Keighley Corporation	2	2	0
Kingston upon Hull Corporation	37	16	0
Knottingley U.D.C.	6	6	0
Leeds Corporation	50	8	0
Machen, Mr. C.	1	1	0
*Marshall, Mr. G. C.	1	5	0
McLintock, Dr. S. W.	1	1	0
Meltham U.D.C.	6	6	0
Mexborough U.D.C. (2)	12	12	0
Middlebrooke, Mr. C. J.	1	1	0
Miller, Dr. J. E.	1	1	0
Mirfield U.D.C.	6	6	0
Moore, Mr. L.		15	0
Morley Corporation	8	8	0
Normanton U.D.C.	6	6	0

North Eastern Coke Distributors' Association	15	15	0
North Eastern Gas Board	84	0	0
Ossett Corporation	6	6	0
Otley U.D.C.	6	6	0
Pontefract Corporation	8	8	0
Pudsey Corporation	8	8	0
Queensbury & Shelf U.D.C.	6	6	0
Rawmarsh U.D.C.	6	6	0
Rotherham Corporation	15	15	0
Royston U.D.C.	6	6	0
Rushton, Mr. J. L.	1	1	0
Scarborough Corporation	2	2	0
Scargill, Mr. M.	1	1	0
*Sharp, Mr. A. I.	1	1	0
Sheffield & District Clean Air Committee	50	8	0
Shipley U.D.C.	8	8	0
Skinningrove Iron Co. Ltd.	10	0	0
Skipton U.D.C.	6	6	0
Slater, Mr. D. J.	1	1	0
Sowerby Bridge U.D.C.	6	6	0
Spenborough Corporation	8	8	0
Stanley U.D.C.	6	6	0
Swinton U.D.C.	6	6	0
Thorne R.D.C.	8	8	0
Todmorden Corporation	6	6	0
Tuckley, Miss B. E.	1	1	0
*Underwood, Dr. G.	1	1	0
Universal Machinery & Services Ltd.	15	15	0
United Steel Companies Ltd.	50	0	0
Wakefield Corporation	10	10	0
Wakefield R.D.C.	6	6	0
Walden, Mr. K. H.	1	1	0
Wath upon Dearne U.D.C.	6	6	0
West Riding Clean Air Advisory Council (2)	10	10	0
Wilson, Mr. H.	1	1	0
Winfield, Mr. E. J.	1	1	0
Wombwell U.D.C.	6	6	0
Wood, Mr. F. T.	1	1	0
Worsbrough U.D.C.	6	6	0
Wortley R.D.C.	8	8	0
York Corporation	5	5	0
Yorkshire Electricity Board	96	0	0

West Midlands Division

	£	s.	d.
Aldridge-Brownhills U.D.C.	15	15	0
Atherstone R.D.C.	8	8	0
Barnes, Mr. & Mrs. A. J.	1	1	0
Bedworth U.D.C.	8	8	0
Birmingham Corporation	50	8	0
Burton upon Trent Corporation	10	10	0
Cadbury Brothers Ltd.	15	15	0
Cannock R.D.C.	8	8	0
Cannock U.D.C.	8	8	0
Coventry Corporation (2)	55	12	0
Cradley Boiler Co. Ltd.	15	15	0
Danks, E. & Co. (Oldbury) Ltd.	15	15	0
Dickinson, Mr. S.	1	1	0
Donaldson, Mr. I. J.	1	1	0
Dudley Corporation	26	5	0
Fletcher, Mr. J. P.	1	5	0
Garner, Mr. N. A.	1	1	0
Gibbons Brothers Ltd.	25	0	0
Gillett, Mr. J. A.	2	2	0
Gittins, Mr. M. J.	1	1	0
Gimson, J. & Co. Ltd.	15	15	0
*Grimmett, Mr. P. H. G.	1	1	0
Guest, Keen & Nettlefold Ltd.	50	0	0
Halesowen Corporation	8	8	0
Hereford Corporation	8	8	0
Hockton, Mr. D.	2	0	0
Kidderminster Corporation	8	8	0
Leamington Spa Corporation	8	8	0
Longley, Mr. J. C.	1	1	0
Lowbridge, Mr. H. E. T.	1	1	0
Magness, Cllr. F. V.	1	1	0
Martine, Dr. W. R.	1	10	0
Meriden R.D.C.	10	10	0
Midland Counties Coke Distributors' Association	15	15	0
Midland Electricity Board	97	0	0
Midlands Joint Advisory Clean Air Council	10	10	0
Moore, Mr. J.	1	1	0
Newcastle under Lyne Corporation	15	15	0
Nuneaton Corporation	10	10	0
Nuneaton Fume Smoke & Noise Abatement Society	3	3	0
Orchard, Mr. G. W.	1	1	0
Owen, Mr. A. G.	1	1	0
*Pringle, Dr. E.	1	1	0
Pringle, Dr. J. E.	1	1	0
Redditch U.D.C.	8	8	0
Reynolds, Mr. F.	1	1	0
*Reynolds, Mr. K.	3	0	0
Rugby Corporation	8	8	0
Rugeley U.D.C.	6	6	0
Seisdon R.D.C.	2	2	0
Smart, Mr. R. C.		10	6
Solihull Corporation	15	15	0
Stafford Corporation	8	8	0
Staffordshire County Council	30	5	0
Steadman, Mr. A. T.	1	1	0
Stoke on Trent Corporation	37	16	0
Stone R.D.C.	6	6	0
Walsall Corporation	26	5	0
Ward, Mrs. M. G.	1	1	0
Warley Corporation	26	5	0
Warwick Corporation	6	6	0
Warwick R.D.C.	8	8	0
Warwickshire Clean Air Council	26	5	0
Warwickshire County Council	18	18	0
Wellington U.D.C. (2)	6	6	0
West Bromwich Corporation	26	5	0
West Midlands Gas Board	210	0	0
Wolverhampton Corporation	37	16	0
Worcester Corporation	10	10	0

East Midlands Division

	£	s.	d.
Alfreton U.D.C.	6	6	0
Allison, Mr. G.	2	2	0
Beeston & Stampleford U.D.C.	10	10	0
Belper R.D.C.	8	8	0
Belper U.D.C.	6	6	0
Blaby R.D.C.	8	8	0
Blackwell R.D.C.	8	8	0
Bolsover U.D.C.	6	6	0
Boston Corporation	6	6	0
*Brown, Mr. J. A.	1	1	0
Cambridge City	1	1	0
Carlton U.D.C.	8	8	0
Catlow, Mr. J.	3	3	0
Chesterfield Corporation	10	10	0
Chesterfield R.D.C.	10	10	0
Clay Cross U.D.C.	6	6	0
Clowne R.D.C.	6	6	0
Coalite & Chemical Products Ltd.	650	0	0
Coalville U.D.C.	8	8	0
Cooper, Alderman S.	1	1	0
Corby U.D.C.	8	8	0
Crowther, Dr. J. S.	1	1	0
Davies, Dr. D.	1	1	0
Derby Corporation	26	5	0
Dilworth, Mr. J.	1	1	0
Dronfield U.D.C.	6	6	0
Eastern Electricity Board	97	0	0
East Midlands Electricity Board	76	0	0
East Midlands Gas Board	150	0	0
Eales, Mr. C. D.	1	1	0
Gainsborough U.D.C.	6	6	0
Glanford Brigg R.D.C.	8	8	0
Grantham Corporation	8	8	0
Grimsby Corporation	15	15	0
Harrop, Mr. J. A.	2	0	0
Heanor U.D.C.	6	6	0
Hiller, Mr. G. A.	1	1	0
Hinckley U.D.C.	8	8	0
Hucknall U.D.C.	8	8	0
Ilkeston Corporation	8	8	0
Ipswich Corporation	26	5	0
Irthlingborough U.D.C.	6	6	0

Kettering Corporation	8	8	0
King's Lynn Corporation	8	8	0
Kirkby in Ashfield U.D.C.	6	6	0
Leicester Corporation	37	16	0
Lincoln County—Kesteven	10	10	0
Lincoln County—Lindsey	5	5	0
Long Eaton U.D.C.	8	8	0
Loughborough Corporation	8	8	0
Lowestoft Corporation	8	8	0
Low Temperature Coal Distillers Association of Great Britain	15	15	0
Mansfield Corporation	10	10	0
Mansfield Woodhouse U.D.C.	6	6	0
McDonald, Mr. J. D. (2)	2	2	0
Needham, Mr. C. E.	2	0	0
Newark Corporation	6	6	0
Norwich Corporation	26	5	0
Nottinghamshire County Council	10	10	0
Old Fletton U.D.C.	6	6	0
Pane, Mr. R.	2	0	0
Pepperdine, Cllr. E. C. (2)	2	11	0
Peterborough Corporation	10	10	0
*Pleister, Miss E. M. J.	1	1	0
Repton R.D.C.	2	2	0
Rushden U.D.C.	6	6	0
Scopes, Mr. F. V.	1	1	0
Scunthorpe Corporation	10	10	0
Smith, Lt. Col. C. H.	2	2	0
Southwell R.D.C.	8	8	0
Staveley U.D.C.	6	6	0
Stewarts & Lloyds Ltd.	50	0	0
Sutton in Ashfield U.D.C.	8	8	0
Swadlingcote U.D.C.	6	6	0
Turner, Miss H. E.	2	0	0
*Turner, Mr. T. H.	2	0	0
Wade, Mr. A.	1	1	0
Waring, Mr. F. L.	5	5	0
Weldon, Miss G. M.	2	2	0
Wellingborough U.D.C.	3	3	0
Welton R.D.C.	6	6	0
Wilkinson, Mr. J. R.	1	10	0
Wisbech Corporation	6	6	0
Worksop Corporation	8	8	0
Worksop R.D.C.	6	6	0

South West Division

	£	s.	d.
Bath Corporation	15	15	0
Bathavon R.D.C.		10	6
Best, Mr. J. K.	1	1	0
Blampied, Mr. F. C.	1	1	0
Bridgwater Corporation	1	1	0
Bristol Corporation	37	16	0
Cawley, Lady	3	0	0
Cheltenham Corporation	10	10	0
Chudley, Mr. J. C.	2	2	0
Colehan, Mr. J. E.	1	1	0
Crook, Mr. S. C.	1	1	0
Draper, Mr. P. (2)	2	2	0
Dursley R.D.C.	6	6	0
Gloucester Corporation	10	10	0
Greenwood, Mr. T. A. S.		15	0
Harris, Mr. J.	1	1	0
Imperial Tobacco Co. Ltd.	26	5	0
Keynsham U.D.C.	1	1	0
Kingswood U.D.C.	8	8	0
Lydney R.D.C.	6	6	0
Mangotsfield U.D.C.	1	1	0
Norton-Radstock U.D.C.	1	1	0
Poole Corporation	15	15	0
Redstone, Mr. R. V.	1	1	0
Shepton Mallet R.D.C.		10	6
Sherborne U.D.C.	1	1	0
Sodbury R.D.C.	4	4	0
South Western Electricity Board	40	0	0
South Western Gas Board	52	10	0
Swindon Corporation	15	15	0
Tetbury R.D.C.		10	6
Tewkesbury Corporation	2	2	0
Thornbury R.D.C.	8	8	0
Wakely, Mr. R. W.	1	1	0
*Wallis, Mrs. E.	1	1	0
Weston super Mare Corporation	2	2	0
West Penwith R.D.C.	6	6	0
Weymouth & Melcombe Regis Corp.	8	8	0
Whiting, Mr. G. C.	2	0	0

South East Division

	£	s.	d.
Abell, Mr. R. H.	1	1	0
Acworth, Miss E. A.	1	1	0
Acworth, Miss W. B.	5	5	0
Allied Iron Founders Ltd.	15	15	0
Ambuco Ltd.	15	15	0
Amersham R.D.C.	8	8	0
Armstrong, Mr. F. W.	1	0	0
Association of Public Health Inspectors	15	15	0
Ault, Mr. H.	1	1	0
Aylesbury Corporation	8	8	0
Barking, London Borough of	26	5	0
Bartlam, Mr. J. N.	1	1	0
Basildon U.D.C.	26	5	0
Bastable, Mr. N.	1	1	0
Baver, Mr. F. W.	1	1	0
Beacon Villages Association	1	1	0
Beaumont, Mr. M.	2	2	0
Bedford Corporation	10	10	0
Bedfordshire County Council	37	16	0
Bexley, London Borough of	26	5	0
Bishop's Stortford U.D.C.	6	6	0
Bletchley U.D.C.	6	6	0
Bligh, Mrs. M.	1	1	0
Bognor Regis U.D.C.	2	2	0
Bonnell, Dr. J. A.	1	1	0
Bottom, Mr. D. W.	1	1	0
Boult, Sir Adrian C.	1	1	0
*Boult, Miss O.	1	1	0
Bournemouth Corporation	2	2	0
*Boyd, Miss D.	1	1	0
Bradford, Mr. S. G.	1	1	0
Bradshaw, Mrs. F. W.	1	1	0
Braintree R.D.C.	6	6	0
Brent, London Borough of	37	16	0
Brentwood U.D.C.	10	10	0
British Iron & Steel Federation	350	0	0
British Medical Association	26	5	0
British Petroleum Co. Ltd.	150	0	0
Bromley, London Borough of	37	16	0
*Brown, Mr. A. W.	1	1	0
*Brown, Mr. T. J.	1	1	0
*Bryant, Miss P. M.	1	1	0
Buckle, G. H. & Partners	26	5	0
Buist, Commander C.	10	10	0
Bullingdon R.D.C.	8	8	0
Burmah Oil Trading Ltd.	15	15	0
Bushey U.D.C.	6	6	0
Butler, Mr. J. W.	2	2	0
Caller, Dr. S.		10	6
Caltex Services Ltd.	15	15	0
Camden, London Borough of	26	5	0
Capes, Mr. F. B.		15	0
Carpenter, The Reverend V. A.		10	6
Carter, Dr. J. S.	4	4	0
Cave, Miss R.	1	1	0
Central Electricity Board	437	0	0
Centri-Spray Ltd.	26	0	0
Charrington Gardener, Lockett & Co. Ltd.	31	10	0
Chatfield, Mr. A. J.	1	1	0
Chesham U.D.C.	6	6	0
Cheshunt U.D.C.	8	8	0
Chigwell U.D.C.	10	10	0
*Chivers, Mr. D. P.		15	0
Clacton U.D.C.	3	3	0
Clarke, Dr. R. T. V.	1	10	0
Clarke, Mr. S. H.	1	0	0
*Clinch, Mr. H. G.	1	1	0
Coal Merchants Federation of Great Britain	100	0	0
Coal Utilisation Council	36	15	0
College of Fuel Technology	15	15	0
Colville, Lt. Comm. R. F.	1	1	0
Cotton, Mr. S. A.	1	1	0

Courtier, Mr. G. B.	1	10	0
Cousin, Lt. Col. A. J.	1	1	0
Crawley U.D.C.	8	8	0
Crosby, Mr. A. S. B.	1	1	0
Croydon, London Borough of	10	10	0
Cuckfield R.D.C.	4	4	0
Curtis, Mr. B.	2	2	0
Darbyshire, Mrs. L. N.	1	1	0
Dartford Corporation	8	8	0
Dartford R.D.C.	8	8	0
Davies, Mr. P. M.	1	1	0
Davies, Mr. E. T. A.	1	1	0
Davis, Dr. J. B.	1	1	0
Day, Mr. L. J.	1	1	0
Daynes, Mr. D. A.	1	1	0
Dimbleby, Mr. T. E.	1	1	0
*Dobson, Mr. P. F.	1	1	0
Dover Corporation	8	8	0
Drummond Dust & Fume Extractors Ltd.	15	15	0
Dust Suppression Ltd.	15	15	0
Eade, Mr. S. A.	1	1	0
Ealing, London Borough of	37	16	0
*East, Mr. R. G.	1	1	0
Eastbourne Corporation	10	10	0
Eastern Gas Board	84	0	0
Easthampstead R.D.C.	10	10	0
Eastleigh Corporation	8	8	0
Easy Heating Co.	15	15	0
*Eaton, Dr. F. J.	3	10	0
Ebben, Mr. G.	1	1	0
Egham U.D.C.	8	8	0
Electrical Association for Women	26	5	0
Electricity Council	363	0	0
*Elsworthy, Mr. J. G.	2	2	0
Enfield, London Borough of	37	16	0
Epping & Ongar R.D.C.	8	8	0
Epsom & Ewell Corporation	10	10	0
Esher U.D.C.	10	10	0
Essex County Council	3	3	0
Esso Petroleum Co. Ltd.	200	0	0
Eton R.D.C.	10	10	0
Farnborough U.D.C.	2	2	0
Federation of British Cremation Authorities	2	2	0
Fell, Mr. N. F.	1	1	0
Fletcher, Mr. J.	1	1	0
Folkestone Corporation (2)	16	16	0
Ford Motor Co. Ltd.	36	15	0
*Forrester, Dr. C.	2	2	0
Fox, Dr. R. H.	1	1	0
Franklin, Charles Ltd.	2	2	0
*Gandy, Mr. H.	1	10	0
*Gandy, Miss R. L.	2	2	0
Gas Council	700	0	0
Gilbert, Mr. E. O.	1	1	0
Gillingham Corporation	10	10	0
Gillison, Dr. J. A.	4	4	0
Gilpin, Mr. A.	1	1	0
Goodeve, Sir C. F.	2	2	0
Gosport Corporation	1	1	0
Graves, Mr. T. G.	1	1	0
Gravesend Corporation	8	8	0
Greater London Council	100	0	0
*Green, Mr. J.	1	1	0
Greenhead, Mr. S.	1	1	0
Greenwich, London Borough of	26	5	0
Greenwood, Mrs. E. L.	2	2	0
Guildford Corporation	10	10	0
Guildford R.D.C.	10	10	0
Guinness, A. Son & Co. Ltd.	26	5	0
Hackney, London Borough of	37	16	0
Hales, Mr. J. S.	2	2	0
Halstead, Mr. V.	1	1	0
Hammersmith, London Borough of	26	5	0
Harrold Leather Mfg. Co. Ltd.	1	1	0
Harrow, London Borough of	26	5	0
Harwich Corporation	6	6	0
Hastings Corporation	10	10	0
Havant & Waterloo U.D.C.	8	8	0
Havering, London Borough of	37	16	0
Held, Mr. P. E. J.	1	1	0
Hemel Hempstead Corporation	8	8	0
Hickman, Miss V.	1	1	0
High Wycombe Corporation	8	8	0
Hillingdon, London Borough of	26	5	0
Hitchin U.D.C.	6	6	0
Hoddesden U.D.C.	6	6	0
Holiday Fellowship Ltd.	2	2	0
Hounslow, London Borough of	26	5	0
Hove Corporation	10	10	0
Hulme, Mr. G. H.	1	5	0
Hussey, Mr. R.	1	1	0
Imperial Chemical Industries Ltd.	100	0	0
Institute of Fuel	26	5	0
Institution of Gas Engineers	15	15	0
Institute of Petroleum	26	5	0
Jackson, Mr. C.	1	1	0
*Jackson, Mr. P. L.	1	1	0
*James, Mr. B. W.	1	0	0
Jellis, Mr. F.	1	1	0
Jones, Mr. W. L.	1	1	0
Joy Trading Corporation	15	15	0
Kendall, Dr. J. G.	1	1	0
Kensington & Chelsea, London Borough of	3	3	0
Kent County Council	5	5	0
*Kershaw, Mr. C. A.	1	1	0
Kingston upon Thames, London Borough of	26	5	0
Kirkpatrick, Mr. D. A.	1	1	0
Lambeth, London Borough of	37	16	0
Langwell, Mr. W. H.	1	1	0
Laundon, Mr. J. R.	1	1	0
Lax, Mrs. G.	1	1	0
Leagrave Press Ltd.	15	15	0
Leatherhead U.D.C.	2	2	0
*Lee, Mr. S. A.	1	5	0
Leverson, Mrs. Gower	1	1	0
Lewin, Mr. J. U.	1	1	0
Lewisham, London Borough of	37	16	0
Little, Mr. J. W.	3	3	0
Littlehampton U.D.C.	1	11	6
London Corporation	50	8	0
London & Counties Coke Distributors' Association	136	10	0
London Electricity Board	82	0	0
London Trades Council	2	2	0
London Transport Board	26	5	0
Lord, Mr. D. G.	1	1	0
Luton Corporation	26	5	0
*Madelin, Sqn. Ldr. I.		15	0
Maidenhead Corporation	8	8	0
Mann, Mr. A. C.	1	1	0
Marshall & Parsons Ltd.	3	0	0
Mason, Mr. J. K.	1	1	0
*Matthews, Dr. N. E.	1	1	0
Medawar, Lady	1	0	0
Melland, Mr. B.	1	10	0
Mellins, Mrs. M. H.	1	1	0
Menuhin, Mr. Y.	1	1	0
Merton, London Borough of	26	5	0
Metal Box Co. Ltd.	15	15	0
Mobil Oil Co. Ltd.	52	10	0
Monkhouse, Dr. A. C.	1	1	0
Moreland, Mr. S.	1	1	0
Municipal Passenger Transport Association (Inc.)	15	15	0
Nagle, Mr. B. R.	1	1	0
National Carbonising Co. Ltd.	26	5	0
National Coal Board	1,000	0	0
New Forest R.D.C.	10	10	0
Newham, London Borough of	5	0	0
Nonhebel, Dr. G.	1	1	0
Northfleet U.D.C.	6	6	0
North Thames Gas Board	210	0	0
Oxford Corporation	26	5	0
Parker, Dr. A.	5	5	0
Parker, Dr. R. A.	3	3	0
Parkinson, Mr. A. C.	1	1	0
Parry, Mr. M.		15	0
Pavey, Mr. A. F.	1	15	0
Pedrick, Mr. F.	1	1	0
Pennington, Mr. W. J.	1	1	0
Petrofina (Gt. Britain) Ltd.	26	5	0
Poole, Mrs. W. M.	1	1	0

Portsmouth Corporation	10	10	0
Potter, Dr. N. M.	1	1	0
Public Transport Association	21	0	0
Radiation Ltd.	31	10	0
Reading Corporation	5	5	0
Redbridge, London Borough of	26	5	0
Reigate Corporation	1	1	0
Rendel, Dr. M. N.	1	1	0
Renwick, Dr. & Mrs. J.	1	0	0
Richards, Mr. J. P.	1	1	0
*Richardson, Mr. R. L.	4	0	0
Richmond, London Borough of (2)	52	10	0
Rickett Cockrell Co. Ltd.	7	7	0
Rickmansworth U.D.C.	8	8	0
Road Haulage Association Ltd.	15	15	0
Robinson, Mrs. E.	2	2	0
Rochester Corporation	8	8	0
Rogers, Mr. E. C.	1	1	0
Rogers, Miss J. S.	1	0	0
Roper, Captain R.		10	6
Rosling, Miss E. M.	1	1	0
Royal Society of Health	15	15	0
St. Albans Corporation	10	10	0
Sansum, Mrs. E. B.	1	1	0
Saunders, Mrs. J.	1	1	0
Scorer, Professor R. S.	1	1	0
Scotson, Mr. D. A.	1	1	0
Shackcloth, Mr. W.	1	1	0
Shanks, Mr. E. C.		15	0
Shaw Scott, Mr. G.	1	1	0
Shell International Petroleum Co. Ltd.	150	0	0
Shell-Mex & B.P. Ltd.	150	0	0
Shieldhouse, Mr. B. S.	1	1	0
Sittingbourne & Milton U.D.C.	6	6	0
Slough Corporation	10	10	0
Smith, Mr. A. R.	2	2	0
Smith, Mrs. P.	1	1	0
Solid Smokeless Fuels Federation	105	0	0
Southampton Corporation	1	1	0
South Eastern Electricity Board	58	0	0
South Eastern Gas Board	210	0	0
Southend on Sea Corporation	2	2	0
Southern Electricity Board	82	0	0
Southern Gas Board	75	0	0
Southwark, London Borough of	37	16	0
Southwick U.D.C.	6	6	0
Sowby, Dr. F. D.	1	1	0
Spoor, Dr. N. L.	1	1	0
Staines U.D.C.	8	8	0
Stansfield, Mr. A. F.	1	1	0
Stewart, Mr. R. E.	2	0	0
Stoddard, Dr. A.	2	0	0
Strood R.D.C.	6	6	0
Stubbs, Mr. G. C.	1	1	0
Sturtevant Engineering Co. Ltd.	2	2	0
Sullivan, Mr. J. S.	1	1	0
Sutherland, Mr. J. W.	1	1	0
Sutton, London Borough of	26	5	0
Taylor, Mr. C. P.	1	1	0
Thurrock U.D.C.	26	5	0
Tiranti, Mr. A.		12	0
Todd, Mr. G. F.	2	2	0
Toussaint, Dr. C. H. C.	1	1	0
Tower Hamlets, London Borough of	26	5	0
Train, Mr. D.	1	1	0
Trianco Ltd.	15	15	0
Trinity Development Ltd.	26	5	0
Trist, R. & Co. Ltd.	31	10	0
Tunbridge Wells Corporation	1	1	0
Turner, Dr. W. C.	1	1	0
Vine, Mr. & Mrs. G. M.	2	2	0
Voeux, Mrs. M. F. Des	5	5	0
Waddell, Mr. A.		15	0
Watford Corporation	10	10	0
Watford R.D.C.	10	10	0
Watson, Professor H. E.	2	0	0
Wermann, Mr. J. C.	1	1	0
Westbrook, Mr. J.	1	1	0
Westminster Corporation	37	16	0
*White Drummond & Co. Ltd.	3	3	0
White, Dr. H. D. J.	1	0	0
Wigan, Mr. N. H.	1	1	0
Willison, Mrs. M. E.	1	1	0
Windsor Corporation	8	8	0
Windsor R.D.C.	6	6	0
Women's Advisory Council on Solid Fuel	15	15	0
Women's Gas Federation	26	5	0
Worthing Corporation	2	2	0
Wycombe R.D.C.	8	8	0
Zink, J. & Co. Ltd.	15	15	0

South Wales & Monmouthshire Division

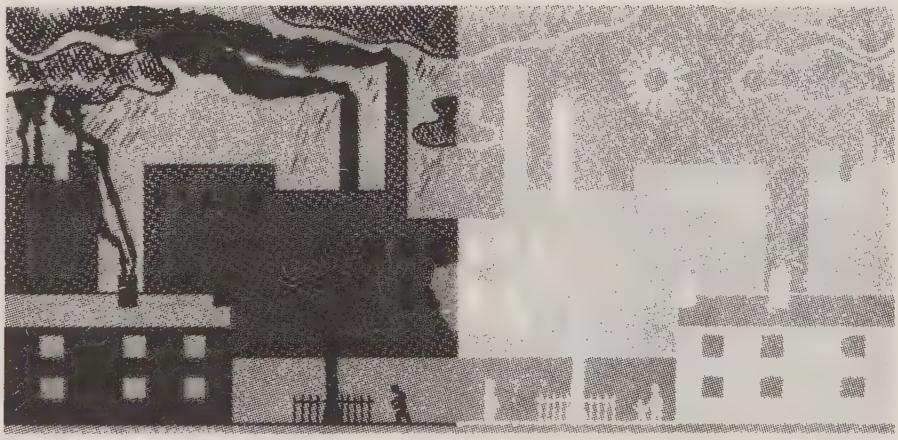
	£	s.	d.
Abercan U.D.C.	6	6	0
Abercwmboi Clean Air Committee	1	1	0
Aberdare U.D.C. (2)	16	16	0
Abertillery U.D.C. (2)	16	16	0
Barry Corporation	8	8	0
Bedwas Machen U.D.C.	6	6	0
Bedwelty U.D.C.	8	8	0
Bridgend U.D.C.	6	6	0
Brownrigg, Mr. M. A.	1	1	0
Caerleon U.D.C.	6	6	0
Caerphilly U.D.C.	8	8	0
Cardiff R.D.C.	8	8	0
Carter, Mr. L. J.	1	1	0
Clarke, Mr. J. A.	1	5	0
Coal Merchants Federation of Wales	5	5	0
Cwbran U.D.C.	6	6	0
Gellygaer U.D.C.	8	8	0
Glamorgan County Council	50	8	0
Harry, Mr. T. W.	1	1	0
Llanelli Corporation	8	8	0
Llanelli R.D.C.	8	8	0
Llantrisant & Llantwit Fardre R.D.C.	8	8	0
Magor & St. Mellons R.D.C.	6	6	0
Merthyr Tydfil Corporation	10	10	0
Monmouthshire County Council	37	16	0
Mountain Ash U.D.C.	8	8	0
Mynyddislwyn U.D.C.	6	6	0
Neath Corporation	8	8	0
Newport Corporation	26	5	0
Penarth U.D.C.	6	6	0
Pontypool U.D.C.	8	8	0
Pontypridd U.D.C.	8	8	0
Port Talbot Corporation	8	8	0
South Wales Electricity Board	46	0	0
Steel Company of Wales Ltd.	50	0	0
Swansea Corporation	26	5	0
Swansea Port Health Authority	15	15	0
Tredegar U.D.C.	6	6	0
Wales Coke Distributor's Association	15	15	0
Wales Gas Board	36	5	0
Ystradgynlais R.D.C.	6	6	0

Overseas Subscriptions

	£	s.	d.
Air Pollution Research Group (2)	12	12	0
Bezares, Mr. F. (Spain)	1	10	0
Brunelle, Mrs. M. F. (U.S.A.)	1	15	0
Buschmann, Mr. C. H. (Netherlands)	1	1	0
China Light & Power Co. Ltd. (Hong Kong)	15	15	0
Chamberlin, Mr. R. L. (U.S.A.)	4	1	4
Danson, Mr. J. (Rhodesia) (2)	2	0	0
De Coster, Mr. J. P. (Belgium)	1	1	0
Du Pont de Nemours International S.A. (Switzerland)	15	15	0
Durban Corporation (South Africa)	50	8	0
Eldridge, Mr. G. S. (Canada)	1	1	0
Elex S.A. (Switzerland)	2	16	0
English, Dr. B. W. (U.S.A.)	4	0	7
Esteban, Dr. F. (Spain)	1	1	0
Feige, Mr. H. J. (Israel) (2)	4	0	0
Fitzgerald, Mr. J. L. (Ireland)	1	0	0
Fox, Mr. R. D. (U.S.A.)	1	2	4
Geleen, Municipality (Netherlands)	8	6	0
Gerhardsson, Mr. G. (Sweden)	1	1	0
Grafe, Dr. K. (Germany)	1	1	0
Griffin, Mr. R. (Rhodesia)	1	1	0

Hong Kong Electric Co. Ltd. (Hong Kong)	15	15	0
Hooton, Mr. K. A. H. (U.S.A.)	1	15	0
Hornbeck, Mr. D. D. (Belgium)	2	10	0
Johannesburg, City (South Africa)	20	0	0
Johnson, Mr. K. R. (South Africa)	2	0	11
Jones, Mr. E. H. (South Africa)	1	1	0
Jones, Mrs. M. A. (South Africa)	1	1	0
Kettner, Dr. H. (Germany)	1	1	0
Leichhardt, Municipality (Australia)	10	10	0
Meuller, Dr. P. K. (U.S.A.)	1	0	0
Newcastle, City (Australia)	2	2	0
O'Conner, Dr. T. C. (Ireland)	1	1	0
Ottolenghi, Mr. A. (Italy)	1	1	0
Panzera, Mr. & Mrs. T. (U.S.A.)	3	1	0
Reif, Dr. A. E. (U.S.A.)	1	1	0
Reifferscheid, Dr. H. (Germany)	1	1	0
Roberts, Mr. L. M. (U.S.A.)	1	18	11
Ruff, Mr. C. D. (U.S.A.)	1	1	2
Smith, Mr. E. M. (U.S.A.)	1	19	8
Sordelli, Dr. D. (Italy)	1	1	0
Taga, Mr. T. (Japan)	1	0	0
Triffett, Mr. A. C. (Australia)	2	0	0
Vereeniging Corporation (South Africa)	1	1	0
Wight, Dr. J. E. (Canada)	1	1	0

CLEAN AIR CONFERENCE AND EXHIBITION



EASTBOURNE

21—24 October 1969

Conference — **Congress Theatre**
Exhibition — **Devonshire Park**

Visitors to the Exhibition will be able to see the latest developments in fuels and appliances and in the products displayed by the leading manufacturers of air pollution control equipment, instruments, incinerators, etc.

Eastbourne Conference

Monday 20 October

20.30 Evening Reception at Floral Hall

Tuesday 21 October

10.30 Opening Session

Civic Welcome by the Mayor of Eastbourne.

Opening Address by Mr. J. P. W. Mallalieu, M.P., Minister of State, Ministry of Technology.

Presidential Address by Sir Kenneth Hutchison, C.B.E., F.R.S.

Formal Opening of the Exhibition by Mr. Mallalieu.

14.30 Open Session "A Clean Air Environment for the Future". Speaker, the Baroness Serota, J.P.

Wednesday 22 October

10.00 Session 3

"Outstanding Pollution Problems in the Ceramic Industry" by Mr. E. Rowden of the National Federation of Clay Industries and Mr. W. H. Holmes of the British Ceramic Research Association.

Aft'noon Technical visits and S.S.F.F. Golf Tournament.

Evening

20.30 Civic Concert in Congress Theatre by courtesy of the Mayor and Corporation of Eastbourne.

Thursday 23 October

10.00 Session 4

"Air Pollution Control in Oil Refining" by Mr. P. Sutton of Esso Petroleum Ltd.

"Sulphur Oxides and Oil Fuels" by Mr. H. I. Fuller of Esso Petroleum Ltd.

14.30 Session 5

"Medical Aspects of Air Pollution" by Professor P. J. Lawther.

Friday 24 October

10.00 Closing Session

"Cement Works: Problems in the Industry" by Mr. E. Burke, Director of Research, Associated Portland Cement Manufacturers Ltd.

"Iron and Steel: Progress towards Clean Air" (two papers) by Mr. P. A. Matthews and Mr. J. H. Flux of the British Steel Corporation.

12.00 Close of Conference

The Conference registration fee this year is eight guineas for nominated delegates. A special concession fee of four guineas will be charged for individual members.

The scheme, started last year, for those persons who were able to attend only one session or the two sessions in the one day, and which made such a successful impact, will be continued. The special "day registration" fee will be two guineas which does not include the printed papers.

HIGH SPEED GAS

High Speed Gas contributes towards a cleaner society because its combustion is clean and complete and does not infringe Clean Air legislation. Use gas for heating, hot water, catering, air conditioning and incineration.

Count the cost in terms of the plus factors of gas, like clean combustion, ease of operation, low maintenance, no delivery, handling or storage problems, Remember, gas is an economical fuel and as North Sea Gas pipelines span the Country, tariffs will become even more favourable.

Gas is the great all-round fuel for a healthy Britain in home, commerce and industry. Check the facts with your Area Gas Board.

Information available for clean air campaigns

EXHIBITION

A complete pre-fabricated and self-contained "Clean Air" Exhibition: adaptable in size with one, two, three or four approved smokeless appliances under fire, and displays of the smokeless fuels available in the district

MOBILE UNITS

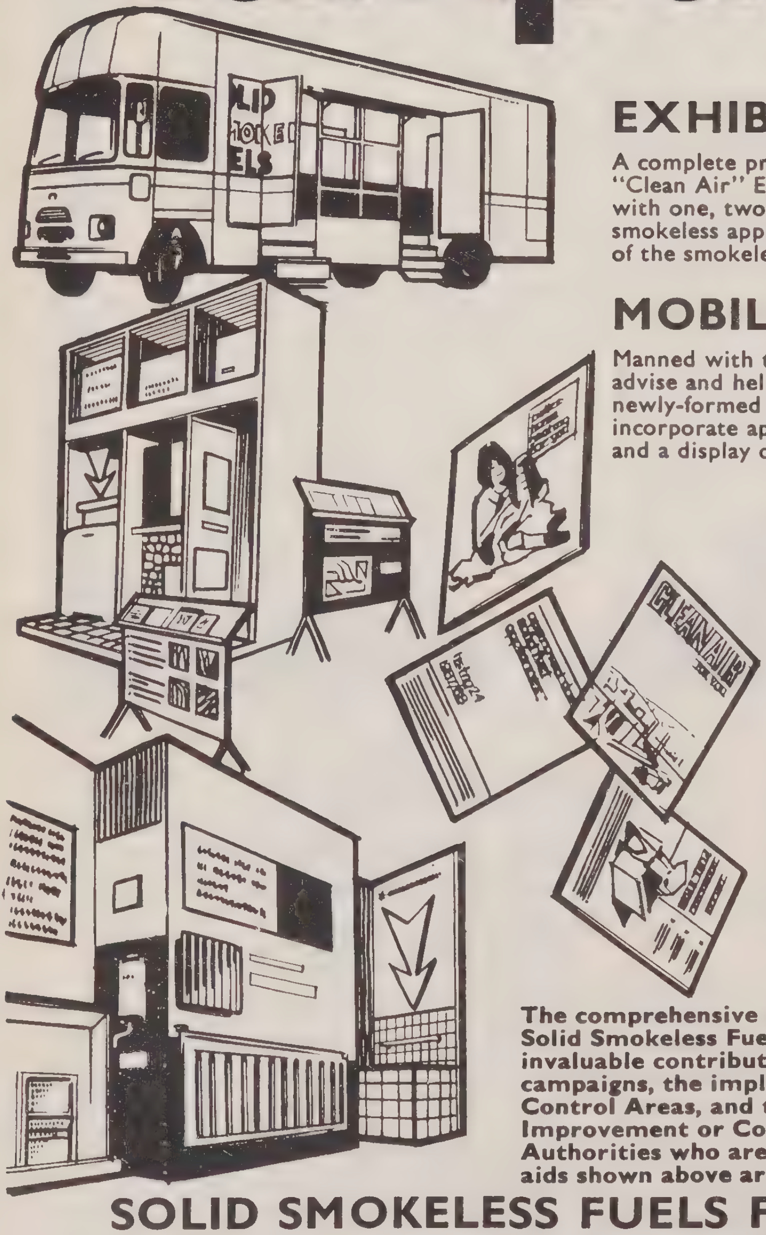
Manned with technical demonstrators, to advise and help residents in proposed or newly-formed Smoke Control Areas. They incorporate approved appliances under fire and a display of the solid smokeless fuels

DISPLAYS

A range of portable units variously displaying instructional panels dealing with Clean Air and the Act, a typical central heating unit, fuel displays and literature displays

LITERATURE

Informative literature is available free to Local Authorities explaining the Clean Air Act, and giving full information on solid smokeless fuels and the appliances



The comprehensive services offered free by the Solid Smokeless Fuels Federation can make an invaluable contribution to "Clean Air" campaigns, the implementation of Smoke Control Areas, and the organization of House Improvement or Conversion schemes. Local Authorities who are interested in utilizing the aids shown above are invited to apply to:

SOLID SMOKELESS FUELS FEDERATION
York House, Empire Way, Wembley, Middlesex

S57

TRADE DIRECTORY AND BUYERS' GUIDE

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ENQUIRIES FOR ADVERTISING SPACE:

Advertisement Manager, National Society for Clean Air, Field House, Breams Buildings, London E.C.4. Tel: 01-242 5038.

RATES:

First entry under classified heading, £2; branch addresses 10/- each, extra.
Second and further entries under other headings £1 each and 5/- per branch address.

AIR CONDITIONERS (DOMESTIC)

M. L. Industrial Products Ltd.
292 Leigh Road, Trading Estate, Slough, Bucks. (Slough 26244 & 23838) (*Worthington*).

AIR CONDITIONING EQUIPMENT

Air Movement Ltd.
Dover Road, Northfleet, Kent (Gravesend 64844).

Airwick Ltd.
11 Stoke Poges Lane, Slough, Bucks. (Slough 33433).

A.P.L Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook, Bucks. (Colnbrook 2185) (*Pithers Radiant Stoves*).

August's Ltd.
Exmoor Street, Halifax, Yorkshire (Halifax 61245-9) (Telex: 51642) (*August-National hydro-filter*).

Birfield Filtration Ltd.
44 Bradford Street, Birmingham 5 (021-643 7961) (*Farr air filters*).

Carrier Engineering Company. Ltd.
Carrier House, Warwick Row, London, S.W.1 (01-834 6858).

Luwa (U.K.) Ltd.
36-41 High Street, South Norwood, London, S.E.25 (01-653 6515).
96 Chapel Road, Sale, Cheshire (061-962 1468).

M. L. Industrial Products Ltd.
292 Leigh Road, Trading Estate, Slough, Bucks. (Slough 26244 & 23838) (*Worthington*).

Norris Warming Co. Ltd.
Burley House, 5-11 Theobalds Road, London, W.C.1 (01-405 7833).
2-3 Melrose Avenue, Clifton 8, Bristol (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 15 (061-872 3454).
Cross House, Westgate Road, Newcastle (Newcastle 611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

Powell Duffryn Engineering Co. Ltd.
Light Products Division, Berkshire House, High Street, Maidenhead, Berks. (Maidenhead 30311) (*Sly, Dynaflow, Carlyle*).

Spencer & Halstead Ltd.
Ossett, Yorkshire (Ossett 5121).
84 High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031).
Spenstead House, Ashley Road, Epsom (Epsom 27101) (*"Spenstead"*).

W. H. S. (Pathfinder) Ltd.
Brockhampton Lane, Havant PO9 1JF, Hants. (Havant 3661) (Cable address: Pathfinder, Portsmouth) (*"Pathfinder"*).

AIR DIFFUSERS

Norris Warming Co. Ltd.
Burley House, 5-11 Theobalds Road, London, W.C.1 (01-405 7833).
2-3 Melrose Avenue, Clifton 8, Bristol (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 15 (061-872 3454).
Cross House, Westgate Road, Newcastle (Newcastle 611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

AIR FILTER MATERIALS

Bondina Industrial Ltd.
Greetland, Halifax, Yorkshire (Elland 3527/8) (*Bondina Rollabond*)

AIR POLLUTION CONTROL EQUIPMENT

Centri-Spray Ltd.
Green Dragon House, 64-70 High Street, Croydon, CR9 ILG, Surrey (01-688 7431) (Telex: 261251).

Centri-Spray G.m.b.H.
Lloyd Haus, Neue Weyerstrasse, Koln 5, W. Germany (23 59 28) (Telex: 888 2415).

Centri-Spray S.A.R.L.
88 Avenue Victor Hugo, Paris, 16 eme, France (704 3066) (Telex: 62150).

AIR POLLUTION MEASUREMENT

C. F. Casella & Co. Ltd.
Regent House, Britannia Walk, London, N.1 (01-253 8581).

Charles Austen Pumps Limited
Petersham Works, 100 Royston Road, Byfleet, Surrey (Byfleet 43224/5) (*Dymax small oil free diaphragm pumps*).

Fleming Instruments Ltd.
Caxton Way, Stevenage, Herts. (Stevenage 3101/5) (Telex: 82385) (*particle sizing and analysing*).

Glass Developments Ltd.
Sudbourne Road, Brixton, London, S.W.2 (01-274 4041) (*air pollution measurement equipment*).

Kavag-Uop Air Correction Co. Ltd.
11-12 Pall Mall, London, S.W.1 (01-930 7911).
Somerset House, George Street, Halifax, Yorks. (0422 65109) *(air correction equipment)*.

Leeds & Northrup Ltd.
Wharfdale Road, Tyseley, Birmingham 11 (021-706 6171).
20 Peel Street, Kensington, London, W.8 (01-727 2353) (*"Speedomax" indicators, recorders and controllers*).

Serck Visco
161 Stafford Road, Croydon, CR9 4DT, Surrey (01-686 3861/9) (*"Visco"*).

AIR STERILIZATION

W. H. S. (Pathfinder) Ltd.
Brockhampton Lane, Havant, PO9 1JF, Hants. (Havant 3661) (Cable address: Pathfinder, Portsmouth (*"Pathfinder"*).

AUTOMATIC CONTROL EQUIPMENT

Elliott Process Automation Ltd.
Head Office (Southern Region and Overseas): Century Works, Lewisham, S.E.13 (01-892 1271) (Telex: 2469) (Cables: Eilliotauto London, S.E.13).
Midland Region: 54 College Road, Perry Bar, Birmingham, 22B (021-356 5863/9) (Telex: 33764) (Cables: Elliotauto Birmingham).
North East Region: Duke House, Duke Street, Newcastle-upon-Tyne, 1 (Newcastle-upon-Tyne (0632) 611181) (Telex: 53276) (Cables: Elliotauto Newcastle-upon-Tyne).
North West Region: Tudor House, Meadway, Bramhall, Stockport, Cheshire (061-439 5000) (Telex: 66358) (Cables: Elliotauto Bramhall).
Scotland: Norfolk House, Princes Square, East Kilbride, Glasgow, Lanarkshire (East Kilbride (03552) 25311/2/3, 28317/8) (Telex: 77708) (Cables: Elliotauto Glasgow).

Hoval Boilers (U.K.) Ltd.
Northway House, High Road, Whetstone, London, N.20 (01-445 0454-7) & (01-445 0092/4)
Works: The Farrar Boiler Works Ltd., Newark-on-Trent, Notts. (*Hoval/Biral*).

Metro-Flex Group of Companies
Metro-Flex Works, Earl Cottages, Earl Road, London, S.E.1 (01-237 4331) (*"Metro-Flex"*).

Photoelectronics (Arcall) Ltd.
92 Oldfield Road, Sutton, Surrey (01-644 4571) (Telex: 262026).

BACTERIA SAMPLING EQUIPMENT

C. F. Casella & Co. Ltd.
Regent House. Britannia Walk, London, N.1 (01-253 8581)

BOILERS, DOMESTIC

Hoval Boilers (U.K.) Ltd.
Northway House, High Road, Whetstone, London, N.20 (01-445 0454-7) & (01-445 0092-4).
Works: The Farrar Boiler Works Ltd., Newark-on-Trent, Notts. (*Hoval/Biral*).

Radiation Central Heating Ltd.
Radiation House, North Circular Road, Willesden, London, N.W.10 (01-459 1234) (*"Heatmaster", "Ductair"*).

BOILERS, INDUSTRIAL

Babcock & Wilcox (Operations) Ltd.
Babcock House, 209 Euston Road, London, N.W.1 (01-387 4321).
Rutland House, 148 Edmund Street, Birmingham, 3 (CENtral 6131).
Aylward House, Wine Street, Bristol, 1 (Bristol (C) 294561).
54 West Nile Street, Glasgow, C.1 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (061-236 8326).
Stonebow House, The Stonebow, York (York 58645).

Cochran & Co., Annan, Ltd.
Annan, Dumfriesshire, Scotland (Annan 2111).
Lesley Court, 22-23 Strutton Ground, Westminster, London, S.W.1 (01-222 4441) (*Chieftain*).

Cradley Boiler Co. Ltd.
Cradley Heath, Warley, Worcs. (Cradley Heath 66003/5) (*"Steampacket" packaged boilers*).

Edwin Danks & Co. (Oldbury) Ltd.
P.O. Box 4, Oldbury, Warley, Worcs. (021-552 2531).

Hamworthy Engineering Ltd.
Fleets Corner, Poole, Dorset (Poole 5123) (*burners and boilers*).

Hoval Boilers (U.K.) Ltd.
Northway House, High Road, Whetstone, London, N.20 (01-445 0454-7) & (01-445 0092-4).
Works: The Farrar Boiler Works Ltd., Newark-on-Trent, Notts. (*Hoval/Biral*).

BOILERS, INDUSTRIAL (SOLID FUEL)

Cradley Boiler Co. Ltd.
Cradley Heath, Warley, Worcs. (Cradley Heath 66003/5) (*"Steampacket" packaged boilers*).

Edwin Danks & Co. (Oldbury) Ltd.
P.O. Box 4, Oldbury, Warley, Worcs. (021-552 2531).

BOILERS, INDUSTRIAL (WASTE-FIRED)

G. F. Rider (Process Plant) Ltd.
Leeds Place Works, Tollington Park, London, N.4 (01-272 0404)

BOILERS, PACKAGED (OIL-FIRED)

Auto Combustions (London) Ltd.
360-364 Wandsworth Road, London, S.W.8 (01-622 9121) (*Swirlamiser and Autoflame oil burners*).

Cradley Boiler Co. Ltd.
Cradley Heath, Warley, Worcs. (Cradley Heath 66003/5) (*"Steampacket" packaged boilers*).

Edwin Danks & Co. (Oldbury) Ltd.
P.O. Box 4, Oldbury, Warley, Worcs. (021-552 2531).

Hamworthy Engineering Ltd.
Fleets Corner, Poole, Dorset (Poole 5123) (*burners and boilers*).

BURNERS, GAS

Auto Combustions (London) Ltd.
360-364 Wandsworth Road, London, S.W.8 (01-622 9121) (*Swirlamiser and Autoflame oil burners*).

Babcock & Wilcox (Operations) Ltd.
Babcock House, 209 Euston Road, London, N.W.1 (01-387 4321).
Rutland House, 148 Edmund Street, Birmingham, 3 (Central 6131).
Aylward House, Wine Street, Bristol, 1 (Bristol (C) 294561).
54 West Nile Street, Glasgow, C.1 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (061-236 8326).
Stonebow House, The Stonebow, York (York 58645).

Crittall-Hope Ltd.
Manor Works, Braintree, Essex (Braintree 106).
Smethwick, Warley, Worcs. (021-558 2191). (*Louvres natural draught ventilators*).

Hamworthy Engineering Ltd.
Fleets Corner, Poole, Dorset (Poole 5123) (*burners and boilers*).

BURNERS, OIL

Auto Combustions (London) Ltd.
360-364 Wandsworth Road, London, S.W.8 (01-622 9121) (*Swirlamiser and Autoflame oil burners*).

Babcock & Wilcox (Operations) Ltd.
Babcock House, 209 Euston Road, London, N.W.1 (01-387 4321).
Rutland House, 148 Edmund Street, Birmingham, 3 (Central 6131).
Aylward House, Wine Street, Bristol, 1 (Bristol (C) 294561).
54 West Nile Street, Glasgow, C.1 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (061-236 8326).
Stonebow House, The Stonebow, York (York 58645).

Crittall-Hope Ltd.
Manor Works, Braintree, Essex (Braintree 106).
Smethwick, Warley, Worcs. (021-558 2191) (*Louvres natural draught ventilators*).

Edwin Danks & Co. (Oldbury) Ltd.
P.O. Box 4, Oldbury, Warley, Worcs. (021-552 2531).

Hamworthy Engineering Ltd.
Fleets Corner, Poole, Dorset (Poole 5123) (*burners and boilers*).

BURNERS, SOLID FUELS

Babcock & Wilcox (Operations) Ltd.
Babcock House, 209 Euston Road, London, N.W.1 (01-387 4321).
Rutland House, 148 Edmund Street, Birmingham, 3 (Central 6131).
Aylward House, Wine Street, Bristol, 1 (Bristol 30261/5).
54 West Nile Street, Glasgow, C.1 (Central 9932).
Peter House, Oxford Street, Manchester, 1 (061-236 8326).
Stonebow House, The Stonebow, York (York 58645).

CEILINGS, HEATED

Norris Warming Co. Ltd.
Burley House, 5-11 Theobalds Road, London, W.C.1 (01-405 7833).
2-3 Melrose Avenue, Clifton, 8, Bristol (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 15 (061-872 3454).
Cross House, Westgate Road, Newcastle (Newcastle 611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

CENTRAL HEATING SYSTEMS

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook, Bucks. (Colnbrook 2185) (*Pithers Radiant Stoves*).

A. H. Bibbey Ltd.
High Lane, Stansted, Essex (Stansted 2611/5) (*Husqvarna Heating Appliances*).

Borsari and Co.
8702, Zollikon-Zurich, Switzerland (Zurich 65 86 55) (*fuel oil storage tanks for district heating*).

John Ford Engineers (Plymouth) Ltd.
Hillcrest Works, Oakfield Terrace Road, Cattedown, Plymouth (Plymouth 63351/2).

Norris Warming Co. Ltd.
Burley House, 5-11 Theobalds Road, London, W.C.1 (01-405 7833).
2-3 Melrose Avenue, Clifton, 8, Bristol (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 15 (061-872 3454).
Cross House, Westgate Road, Newcastle (Newcastle 611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

Radiation Central Heating Ltd.
Radiation House, North Circular Road, Willesden, London, N.W.10 (01-459 1234) (*"Heatmaster", "Ductair"*).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

CHIMNEYS

Combustion Equipment Ltd.
Bloors Lane, Rainham, Gillingham, Kent (Medway 32234/6) (*"Cory" grit arrester, "Airlok" and "Interlok" dampers*).

Edwin Danks & Co. (Oldbury) Ltd.
P.O. Box 4, Oldbury, Warley, Worcs. (021-552 2531).

Rodway & Taylor (B'ham) Ltd.
85-90 Buckingham Street, Birmingham 19 (021-236 4027).

Steel Chimneys Ltd.
P.O. Box 1, New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

Tipton Tub & Tube Co. Ltd.
Bloomfield Road, Tipton, Staffs. (021-557 1011 and 3418).

CHIMNEY CLADDING (ALUMINIUM)

Combustion Equipment Ltd.
Bloors Lane, Rainham, Gillingham, Kent (Medway 32234/6) (*"Cory" grit arrester, "Airlok" and "Interlok" dampers*).

Rodway & Taylor (B'ham) Ltd.
85-90 Buckingham Street, Birmingham 19 (021-236 4027).

Steel Chimneys Ltd.
P.O. Box 1, New Hall Works, Lower Edge Road, Elland, Yorkshire (Elland 2431).

CHIMNEYS (INSULATED)

Thermotank Products Division
Chapelhall Industrial Estate, By Airdrie, Lanarkshire (Airdrie 4871).
60 Rochester Row, London, S.W.1 (01-828 5415) (*Dri-bore chimneys*) (*Insulated*).

CLEAN ROOMS

Air Movement Ltd.
Dover Road, Northfleet, Kent (Gravesend 64844).

Birfield Filtration Ltd.
44 Bradford Street, Birmingham, 5 (021-643 7961) (*Farr air filters*).

Constant Air Systems Ltd.
Raebarn House, Northolt Road, Harrow, Middlesex (01-864 0288).
Wolverley House, Digbeth, Birmingham, 5 (021-643 5148).

Norris Warming Co. Ltd.
Burley House, 5-11 Theobalds Road, London, W.C.1 (01-405 7833).
2-3 Melrose Avenue, Clifton, 8, Bristol (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 15 (061-872 3454).
Cross House, Westgate Road, Newcastle (Newcastle 611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

W.H.S. (Pathfinder) Ltd.
Brockhampton Lane, Havant PO9 1JF, Hants. (Havant 3661) (Cable Address: Pathfinder, Portsmouth) (*"Pathfinder"*).

COAL HANDLING PLANT

Buell Ltd.
George Street Parade, Birmingham 3 (021-236 5391) (*Buell industrial drying dust collection and powder classification plants*).

Edwin Danks & Co. (Oldbury) Ltd.
P.O. Box 4, Oldbury, Warley, Worcs. (021-552 2531).

COMBUSTION TESTING EQUIPMENT

Elliott Process Automation Ltd.
Head Office (Southern Region and Overseas): Century Works, Lewisham S.E.13 (01-892 1271) (Telex: 22469) (Cables: Elliotauto London, S.E.13).
Midland Region: 54 College Road, Perry Barr, Birmingham, 22B (021-356 5863/9) (Telex: 33764) (Cables: Elliotauto Birmingham).
North East Region: Duke House, Duke Street, Newcastle-upon-Tyne, 1 (Newcastle-upon-Tyne (0632) 611181) (Telex: 53276) (Cables: Elliotauto Newcastle-upon-Tyne).
North West Region: Tudor House, Meadway, Bramhall, Stockport, Cheshire (061-439 5000) (Telex: 66358) (Cables: Elliotauto Bramhall).
Scotland: Norfolk House, Princes Square, East Kilbride, Glasgow, Lanarkshire (East Kilbride (03552) 25311/2/3, 28317/8) (Telex: 77708) (Cables: Elliotauto Glasgow).

Shandon Scientific Co. Ltd.
65 Pound Lane, London, N.W.10 (01-459 8671) (*Scientific instruments/Bacharach*).

CONTRACTORS, HEATING

Borsari and Co.
8702, Zollikon-Zurich, Switzerland (Zurich 65 86 55) (*fuel oil storage tanks: reinforced concrete, ceramic tile lined*).

CONTRACTORS, HEATING, VENTILATING & AIR CONDITIONING

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Polye Road, Colnbrook, Bucks. (Colnbrook 2185) (*Pithers Radiant Stoves*).

Carrier Engineering Company Ltd.
Carrier House, Warwick Row, London, S.W.1 (01-834 6858).

Constant Air Systems Ltd.
Raebarn House, Northolt Road, Harrow, Middlesex (01-864 0288).
Wolverley House, Digbeth, Birmingham, 5 (021-643 5148).

Crittall-Hope Ltd.
Manor Works, Braintree, Essex (Braintree 106).
Smethwick, Warley, Worcs. (021-558 2191) (*Louvres natural draught ventilators*)

Fan Application & Engineering Ltd.
76 Rivington Street, London, E.C.2 (01-739 9329).

John Ford Engineers (Plymouth) Ltd.
Hillcrest Works, Oakfield Terrace Road, Cattedown, Plymouth (Plymouth 63351/2).

Norris Warming Co. Ltd.
Burley House, 5-11 Theobalds Road, London, W.C.1 (01-405 7833).
2-3 Melrose Avenue, Clifton, 8, Bristol (Bristol 30261/5).
Norris House, 611 Stretford Road, Manchester, 15 (061-872 3454).
Cross House, Westgate Road, Newcastle (Newcastle 611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (Ipswich 57171).

CONTROLLED DRAUGHT REGULATORS

Metro-Flex Group of Companies
Metro-Flex Works, Earl Cottages, Earl Road, London, S.E.1 (01-237 4331) (*"Metro-Flex"*).

CONVECTORS

A. H. Bibbey Ltd.
High Lane, Stansted, Essex (Stansted 2611/5) (*Husqvarna Heating Appliances*).

Radiation Gas Fires Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

COOLERS

Buell Ltd.
George Street Parade, Birmingham 3 (021-236 5391) (*Buell industrial drying dust collection and powder classification plants*).

Serck Visco
161 Stafford Road, Croydon CR9 4DT, Surrey (01-686 38619) (*"Visco"*).

DAMPERS

Combustion Equipment Ltd.
Bloors Lane, Rainham, Gillingham, Kent (Medway 32234-6) (*"Cory" grit arrester, "Airlok" and "Interlok" dampers*).

Metro-Flex Group of Companies
Metro-Flex Works, Earl Cottages, Earl Road, London, S.E.1 (01-237 4331) (*"Metro-Flex"*).

DEHUMIDIFIERS

Heather Filters Ltd.
17 Addiscombe Road, Croydon CR9 2DE (01-686 2411) (*"Humexair"*).

DISCHARGE VALVES

Buell Ltd.
George Street Parade, Birmingham 3 (021-236 5391) (*Buell industrial drying dust collection and powder classification plants*).

Nailsea Engineering Co. Ltd.
Samlesbury Airfield, Blackburn, Lancs. (Mellor 666) (Telex: 63146) (*"Pnu-Jet" dust filters and collectors*).

Western Precipitation Division
Joy Trading Corporation
7 Harley Street, London W.1 (01-580 7711) (*Electrostatic Precipitators, Thermoflex Glass Bag Filters, Multiclone mechanical collectors, Turbulaire Scrubbers, Joy Microdyne scrubbers, Dust Valves*).

DUCT HEATERS

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook, Bucks. (Colnbrook 2185) (*Pithers Radiant Stoves*).

DUCTING

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road Colnbrook, Bucks. (Colnbrook 2185). (*Pithers Radiant Stoves*).

Combustion Equipment Ltd.
Bloors Lane, Rainham, Gillingham, Kent (Medway 32234-6) (*"Cory" grit arrester, "Airlok" and "Interlok" dampers*).

John Ford Engineers (Plymouth) Ltd.
Hillcrest Works, Oakfield Terrace Road, Cattedown, Plymouth (Plymouth 63351/2)

Hainault Engineering Co. Ltd.
2-6 Fowler Road, Hainault, Ilford, Essex (01-500 1253).
21 Highmoor, Kirkhill, Morpeth, Northumberland (*Hainault-air heaters*).

Henderson Safety Tank Co. Ltd.
Croydon Airport, Croydon CR9 4LY, Surrey (01-688 7777).

Radiation Central Heating Ltd.
Radiation House, North Circular Road, Willesden, London, N.W.10 (01-459 1234) (*"Heatmaster", "Ductair"*).

Tipton Tub & Tube Co. Ltd.
Bloomfield Road, Tipton, Staffs. (021-557 1011 and 3418).

DUST CLASSIFICATION PLANT

Buell Ltd.
George Street Parade, Birmingham 3 (021-236 5391) (*Buell industrial drying dust collection and powder classification plants*).

DUST COLLECTION PLANT

Bigwood Dust Control
Wednesfield Road, Wolverhampton, Staffs. (Wolverhampton 24771) (*Dust collection equipment*).

DUST COLLECTION EQUIPMENT & PLANT

Alldays & Onions Ltd.
P.O. Box 234, Great Western Works, Sydenham Road, Birmingham, 11 (021-772 2551/4).

Ambuco Ltd.
38-40 Featherstone Street, London E.C.1, (01-253 7573).

N. H. Macdonald
MacCarthy Services Ltd., 15 Sandhill, Newcastle-upon-Tyne 1.

Dron & Dickson Ltd.
31 Kelvin Grove Street, Glasgow, C.3 (*industrial dust recovery and fume clearing plant*).

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook, Bucks. (Colnbrook 2185) (*Pithers Radiant Stoves*).

Buell Ltd.
George Street Parade, Birmingham 3 (021-236 5391) (*Buell industrial drying dust collection and powder classification plants*).

B.V.C. Engineering Ltd.
Leatherhead, Surrey (Ashtead 6121).

Centri-Spray Ltd.
Green Dragon House, 64-70 High Street, Croydon, CR9 1LG Surrey (01-688 7431) (Telex: 261251).

Centri-Spray G.m.b.H.
Lloyd Haus, Neue Weyerstrasse, Köln, 5, W. Germany (23 59 28) (Telex: 8882415).

Centri-Spray S.A.R.L.
88 Avenue Victor Hugo, Paris 16 eme, France (704 3066) (Telex: 62150).

Chemical Construction (G.B.) Ltd.
Regal House, Twickenham, Middx (01-892 4455) (*Pease Anthony scrubbers*).

Constant Air Systems Ltd.
Raebarn House, Northolt Road, Harrow, Middx (01-864 0288).
Wolverley House, Digbeth, Birmingham, 5 (021-643 5148).

Drummond Dust & Fume Extractors Ltd.
Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (01-527 4441).

Duscon Engineering Ltd.
P.O. Box 8, Berry Hill, Droitwich, Worcs. (Droitwich 3631 (4 lines)).
44 Queen Elizabeths Walk, Wallington, Surrey (Wallington 4154) (*Dusmat, Dusclone, Duspak, Duspray, Dumist*).

Dust Control Equipment Ltd.
Thurmaston, Leicester, LE4 8HP (Syston 3333) (*dust control equipment for industry*).

Fan Application & Engineering Ltd.
76 Rivington Street, London, E.C.2 (01-739 9329).

Fan Systems Ltd.
2 Brazil Street, Manchester, 1, Lancs. (061-236 7156).

W. C. Holmes & Co. Ltd.
Turnbridge, Huddersfield (Huddersfield 31651).
16 St. James's Street, London, S.W.1

Kavag-Uop Air Correction Co. Ltd.
11-12 Pall Mall, London, S.W.1 (01-930 7911) Somerset House, George Street, Halifax, Yorks. (0422 65109) (*air correction equipment*).

Lodge-Cottrell Ltd.
George Street Parade, Birmingham 3 (021-236 3388).
London Office: Simon House, 28/29 Dover Street, London W.1 (01-493 8191).

Mikropul Ltd.
40 Towerfield Road, Shoeburyness, Essex (Shoeburyness 2373-5) ("*Mikro*").

Nailsea Engineering Co. Ltd.
Samlesbury Airfield, Blackburn, Lancs. (Mellor 666) (Telex: 63146) (*"Pnu-Jet" dust filters and collectors*).

Newell Dunford Engineering Ltd.
143 Maple Road, Surbiton, Surrey (01-546 7799) (*Airmix, Tubix, Thermix*).

Powell Duffryn Engineering Co. Ltd.
Light Products Division, Berkshire House, High Street, Maidenhead, Berks. (Maidenhead 30311) (*Sly, Dynaflow, Carlyle*).

R. J. Richardson & Sons Ltd.
37 Commercial Street, Birmingham 1 (021-643 2281) (*P.B.X.*).

Serck Visco
161 Stafford Road, Croydon CR9 4DT, Surrey (01-686 3861/9) ("*Visco*").

Spencer & Halstead Ltd.
Ossett, Yorks. (Ossett 5121).
84 High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031).
Spenstead House, Ashley Road, Epsom (Epsom 27101) ("*Spenstead*").

Tilghman Wheelabrator Ltd.
Broadheath, Altrincham, Cheshire (061-928 4242).
London Office: Carolyn House, Dingwall Road, Croydon, Surrey (01-688 7382/3).

Western Precipitation Division Joy Trading Corporation.
7 Harley Street, London, W.1 (01-580 7711) (*Electrostatic Precipitators, Thermoflex Glass Bag Filters, Multiclone mechanical collectors, Turbulaire Scrubbers, Joy Microdyne scrubbers, Dust Valves*).

DUST SAMPLING EQUIPMENT

Airflow Developments Ltd.
Lancaster Road, High Wycombe, Bucks. (0494 25252).

C. F. Casella & Co. Ltd.
Regent House, Britannia Walk, London, N.1. (01-253 8581).

Fleming Instruments Ltd.
Caxton Way, Stevenage, Herts. (Stevenage 3101-5) (Telex: 82385) (*particle sizing and analysing*).

ELECTRIC HEATING EQUIPMENT

Isopad Ltd.
Barnet By-Pass, Borehamwood, Herts. (01-953 2817) (*electric surface heaters*).

ELECTRIC HEATING SYSTEMS

Husqvarna Heat-Pak Ltd.
High Lane, Stansted, Essex (Stansted 2611-5).
43 James Watt Place, East Kilbride, Lanarkshire, Scotland (East Kilbride 29188) (*Husqvarna Electricaire*).

ELECTRICAL PRECIPITATORS

Harris Engineering Co. Ltd.
Longfield Road, Tunbridge Wells, Kent (Tunbridge Wells 23401).
Stone Yard, Deritend, Birmingham 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol 8 (Bristol 30371).
75 Piccadilly, Manchester 1 (Central 3546/7).

Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

Head Wrightson Process Engineering Ltd.
P.O. Box 10, Teesdale Works, Stockton-on-Tees, Teesside, England (OMH 2 62241).

W. C. Holmes & Co. Ltd.
Turnbridge, Huddersfield (Huddersfield 31651).
16 St. James's Street, London, S.W.1.

Kavag-Uop Air Correction Co. Ltd.
11-12 Pall Mall, London, S.W.1 (01-930 7911).
Somerset House, George Street, Halifax, Yorks. (0422 65109) (*air correction equipment*).

Serck Visco
161 Stafford Road, Croydon CR9 4DT, Surrey (01-686 3861/9) (*"Visco"*).

Western Precipitation Division Joy Trading Corporation
7 Harley Street, London, W.1 (01-580 7711) (*Electrostatic Precipitators, Thermoflex Glass Bag Filters, Multiclone mechanical collectors, Turbulaire Scrubbers, Joy Microdyne scrubbers, Dust Valves*).

ENGINEERS—CONSULTANTS

Adams & Adams
4 Carlton Crescent, Southampton, Hants, SO1 2EY (0703 22602) (*heating, ventilatting and air conditioning*).

FANS

Airflow Developments Ltd.
Lancaster Road, High Wycombe, Bucks. (0494 25252).

Alldays & Onions Ltd.
P.O. Box 234, Great Western Works, Sydenham Road, Birmingham 11 (021-772 2551/4).

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook, Bucks. (Colnbrook 2185) (*Pithers radiant stoves*).

Edgar Allen Aerex Ltd.
P.O. Box 46, Imperial Steel Works, Sheffield S9 1QZ (Sheffield 49054).
Robertson House, Leas Road, Guildford, Surrey (0483 76666).
Portland Buildings, Portland Road, Aldridge, Staffs. (0922 52173).
Barton Chambers, off St. Anns Square, Manchester (061-832 6477) (*standard and special axial and centrifugal fans*).

Fan Systems Ltd.
2 Brazil Street, Manchester 1, Lancs. (061-236 7156).

Spencer & Halstead Ltd.
Ossett, Yorks. (Ossett 5121).
84 High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031).
Spenstead House, Ashley Road, Epsom (Epsom 27101) (*"Spenstead"*).

FILTERS, AIR

Birfield Filtration Ltd.
44 Bradford Street, Birmingham, 5 (021-643 7961) (*Farr air filters*).

Duscon Engineering Ltd.
P.O. Box 8, Berry Hill, Droitwich, Worcs. (Droitwich 3631) (4 lines).
44 Queen Elizabeths Walk, Wallington, Surrey (Wallington 4154) (*Dusmat, Dusclone, Duspak, Duspray, Dumist*).

Harris Engineering Co. Ltd.
Longfield Road, Tunbridge Wells, Kent (Tunbridge Wells 23401).
Stone Yard, Deritend, Birmingham 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol 8 (Bristol 30371).
75 Piccadilly, Manchester 1 (Central 3546/7).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

Heather Filters Ltd.
17 Addiscombe Road, Croydon CR9 2DE (01-686 2411) (*"Multi-Brush"*).

Luwa (U.K.) Ltd.
36-41 High Street, South Norwood, London, S.E.25 (01-653 6515).
96 Chapel Road, Sale, Cheshire (061-962 1468).

Nailsea Engineering Co. Ltd.
Samlesbury Airfield, Blackburn, Lancs. (Mellor 666) (Telex: 63146) (*"Pnu-Jet" dust filters and collectors*).

Serck Visco
161 Stafford Road, Croydon CR9 4DT, Surrey (01-686 3861/9) ("*Visco*").

Spencer & Halstead Ltd.
Ossett, Yorks. (Ossett 5121).
84 High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031).
Spenstead House, Ashley Road, Epsom (Epsom 27101) (*"Spenstead"*).

Tilghman Wheelabrator Ltd.
Broadheath, Altrincham, Cheshire. (061-928 4242.
London Office:
Carolyn House, Dingwall Road, Croydon, Surrey. (01-688 7382/3)

FILTERS, AIR MEDIA

Declon Foam Plastics Ltd.
Cranborne Estate, Cranborne Road, Potters Bar, Herts. (Potters Bar 57151) (*"Selmat" air filter media*).

FIRE LIGHTERS (ELECTRIC)

Best Products Ltd.
Ranelagh House, Felixstowe, Suffolk (Felixstowe 3154-6) (*"Matchless" firelighter*).

FLUE ASH & CLINKER CONVEYING PLANT

B.V.C. Engineering Ltd.
Leatherhead, Surrey (Ashtead 6121).

FLUE DUST EXTRACTION PLANT

Buell Ltd.
George Street Parade, Birmingham 3 (021-236 5391) (*Buell industrial drying dust collection and powder classification plants*).

B.V.C. Engineering Ltd.
Leatherhead, Surrey (Ashtead 6121).

Head Wrightson Process Engineering Ltd.
P.O. Box 10, Teesdale Works, Stockton-on-Tees, Teesside, England (OMH 2 62241).

W. C. Holmes & Co. Ltd.
Turnbridge, Huddersfield (Huddersfield 31651).
16 St. James's Street, London S.W.1.

Western Precipitation Division Joy Trading Corporation
7 Harley Street, London, W.1 (01-580 7711) (*Electrostatic Precipitators, Thermoflex Glass Bag Filters, Multiclone mechanical collectors, Turbulaire Scrubbers, Joy Microdyne scubbers, Dust Valves*).

FLUE GAS DUST MONITORING DEVICE (C.E.G.B. TYPE)

Airflow Developments Ltd.
Lancaster Road, High Wycombe, Bucks. 0494 25252).

Photoelectronics (Arcall) Ltd.
92 Oldfield Road, Sutton, Surrey (01-644 4571) (Telex: 262026).

FLUE GAS DUST SAMPLING EQUIPMENT (B.C.U.R.A. TYPE)

Airflow Developments Ltd.
Lancaster Road, High Wycombe, Bucks. (0494 25252).

FLUE GAS TREATMENT

D.C.P. Systems Ltd.
Centre Heights, 137 Finchley Road, London, N.W.3 (01-586 1121).

FUEL EFFICIENCY ADVISORY SERVICE

National Industrial Fuel Efficiency Service
Abford House, 15 Wilton Road, London, S.W.1 (01-828 8241).

FUEL—ELECTRICITY SUPPLY

The Electricity Council
30 Millbank, London, S.W.1 (01-834 2333).
Marketing Department: Trafalgar Buildings, 1 Charing Cross, London, S.W.1 (01-930 6757).

FUEL—GAS

The Gas Council
59 Bryanston Street, Marble Arch, London W1A 2AZ (01-723 7030).

Scottish Gas Board
Granton House, 340 West Granton Road, Edinburgh, 5 (031-552 6271).

Northern Gas Board
G.P.O. Box 1 G.B., Newcastle-upon-Tyne, 1 (Newcastle 663322).

North Western Gas Board
Welman House, Altrincham, Cheshire (Altrincham 6311).

North Eastern Gas Board
New York Road, Leeds, 2 (Leeds 36291).

East Midlands Gas Board
De Montfort Street, Leicester (Leicester 50022).

West Midlands Gas Board
Wharf Lane, Solihull, Warwickshire (Solihull 6888).

Wales Gas Board
Snelling House, Bute Terrace, Cardiff (Cardiff 33131).

Eastern Gas Board
Sun Building, Clarendon Road, Watford (Watford 28555).

North Thames Gas Board
30 Kensington Church Street, London, W.8 (Western 8141).

South Eastern Gas Board
Katherine Street, Croydon, Surrey (Croydon 4466).

Southern Gas Board
164 Above Bar, Southampton (Southampton 75544).

South Western Gas Board
9a Quiet Street, Bath (Bath 60411).

FUEL—GAS (L.P.G.)

Shell-Mex and B.P. Gases Ltd.
Shell-Mex House, Strand, London, W.C.2 (01 - 836 1234) (*"Bottogas" - Butane, "Propagas"-Propane*).

FUEL OIL (DOMESTIC & INDUSTRIAL OIL FUELS)

Shell-Mex and B.P. Ltd.
Shell-Mex House, Strand, London, W.C.2 (01-836 1234).

FUEL OIL STORAGE TANKS (REINFORCED CONCRETE)

Borsari & Co.
8702, Zollikon-Zurich, Switzerland (Zurich 65 86 55) (*tile lined underground tanks of reinforced concrete*).

Edwin Danks & Co. (Oldbury) Ltd.
P.O. Box 4, Oldbury, Warley, Worcs. (021-552 2531).

FUELS (SOLID SMOKELESS)

Coalite & Chemical Products Ltd.
P.O. Box 21, Chesterfield, Derbyshire (Bolsover 2281/6).
103 Mount Street, London W.1 (01-470 7931) (*"Coalite"*).

National Carbonising Co. Ltd.
Mansfield, Notts. (Mansfield 22357).
34 Smith Square, London, S.W.1 (01-222 7331).

Scottish Rexco Ltd.
Comrie, Fife, Scotland (Saline 345) (*"Rexco" smokeless coal*).

National Coal Board
Hobart House, Grosvenor Place, London, S.W.1 (01-235 2020).
Coal Products Division: Coal House, Lyon Road, Harrow, Middlesex (01-427 9001) (*Homefire, Multiheat, Phurnacite, Anthracite, Welsh Dry Steam, Sunbrite*).

FUME REMOVAL EQUIPMENT

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook, Bucks. (Colnbrook 2185) (*Pithers Radiant Stoves*).

Buell Ltd.
George Street Parade, Birmingham 3 (021-236 5391) (*Buell industrial drying dust collection and powder classification plants*).

Centri-Spray Ltd.
Green Dragon House, 64-70 High Street,
Croydon, CR9 1LG Surrey (01-688 7431)
(Telex: 261251).
Centri-Spray G.m.b.H.
Lloyd Haus, Neue Weyerstrasse, Köln 5,
W. Germany (23 59 28) (Telex: 8882415).
Centri-Spray S.A.R.L.
88 Avenue Victor Hugo, Paris 16 eme,
France (704 3066) (Telex: 62150).

Chemical Construction (G.B.) Ltd.
Regal House, Twickenham, Middx (01-
892 4455) (*Pease Anthony scrubbers*).

Constant Air Systems Ltd.
Raebarn House, Northolt Road, Harrow,
Middx (01-864 0288).
Wolverley House, Digbeth, Birmingham 5
(021-643 5148).

Drummond Dust & Fume Extractors Ltd.
Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (01-527 4441).

Duscon Engineering Ltd.
P.O. Box 8, Berry Hill, Droitwich, Worcs.
(Droitwich 3631 (4 lines)).
44 Queen Elizabeths Walk, Wallington,
Surrey (Wallington 4154) (*Dusmat,
Dusclone, Duspak, Duspray, Dumist*).

Fan Application & Engineering Ltd.
76 Rivington Street, London, E.C.2. (01-
739 9329).

Fan Systems Ltd.
2 Brazil Street, Manchester, 1 Lancs.
(061-236 7156).

Head Wrightson Process Engineering Ltd.
P.O. Box 10, Teesdale Works, Stockton-on-Tees, Teesside, England (OMH 2
62241).

W. C. Holmes & Co. Ltd.
Turnbridge, Huddersfield (Huddersfield
31651).
16 St. James's Street, London, S.W.1.

Kavag-Uop Air Correction Co. Ltd.
11-12 Pall Mall, London, S.W.1 (01-930
7911).
Somerset House, George Street, Halifax,
Yorks. (0422 65109) (*air correction
equipment*).

Newell Dunford Engineering Ltd.
143 Maple Road, Surbiton, Surrey (01-
546 7799) (*Airmix, Tubix, Thermix*).

R. J. Richardson & Sons Ltd.
37 Commercial Street, Birmingham 1
(021-643 2281) (*P.B.X.*).

Serck Visco
161 Stafford Road, Croydon CR9 4DT,
Surrey (01-686 3861/9) (*"Visco"*).

Spencer & Halstead Ltd.
Ossett, Yorks. (Ossett 5121).
84 High Street, Cradley Heath, Warley,
Worcs. (Cradley Heath 67031).
Spenstead House, Ashley Road, Epsom
(Epsom 27101) (*"Spenstead"*).

FURNACES, KILNS, OVENS, ETC.

R. M. Catterson-Smith Ltd.
Adams Bridge Works, South Way,
Exhibition Grounds, Wembley, Middx
(01-902 4291) (*electric furnaces*).

Duscon Engineering Ltd.
P.O. Box 8, Berry Hill, Droitwich, Worcs.
(Droitwich 3631 (4 lines)).
44 Queen Elizabeths Walk, Wallington,
Surrey (Wallington 4154) (*Dusmat,
Dusclone, Duspak, Duspray, Dumist*).

FURNACE PRESSURE CONTROLLERS

Metro-Flex Group of Companies
Metro-Flex Works, Earl Cottages, Earl
Road, London, S.E.1 (01-237 4331)
(*"Metro-Flex"*).

GAS CLEANING PLANT

Centri-Spray Ltd.
Green Dragon House, 64-70 High Street,
Croydon, CR9 ILG, Surrey (01-688 7431)
(Telex: 261251).
Centri-Spray G.m.b.H.
Lloyd Haus, Neue Weyerstrasse, Köln 5,
West Germany (23 59 28) (Telex: 888
2415).
Centri-Spray S.A.R.L.
88 Avenue Victor Hugo, Paris 16 eme,
France (704 3066) (Telex: 62150).

W. C. Holmes & Co. Ltd.
Turnbridge, Huddersfield (Huddersfield
31651).
16 St. James's Street, London, S.W.1.

Lodge-Cottrell Ltd.
George Street Parade, Birmingham 3 (021-CEN 3388).
London Office: Simon House, 28/29 Dover Street, London, W.1 (01-493 8191).

Western Precipitation Division Joy Trading Corporation
7 Harley Street, London, W.1 (01-580 7711) (*Electrostatic Precipitators, Thermoflex Glass Bag Filters, Multiclone mechanical collectors, Turbulaire Scrubbers, Joy Microdyne scrubbers, Dust Valves*).

GAS HEATING EQUIPMENT

A. H. Bibbey Ltd.
High Lane, Stansted, Essex (Stansted 2611/5) (*Husqvarna Heating Appliances*).

Harris Engineering Co. Ltd.
Longfield Road, Tunbridge Wells, Kent (Tunbridge Wells 23401).
Stone Yard, Deritend, Birmingham 12, (Midland 9536/7).
19-20 Elmdale Road, Bristol 8 (Bristol 30371).
75 Piccadilly, Manchester 1 (Central 3546/7).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

Radiation Central Heating Ltd.
Radiation House, North Circular Road, Willesden, London, N.W.10 (01-459 1234) (*"Heatmaster", "Ductair"*).

Radiation Gas Fires Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

GAS HEATING EQUIPMENT (BUTANE/PROPANE)

Radiation Gas Fires Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

GAS SCRUBBERS & WASHERS

Ambuco Ltd.
38-40 Featherstone Street, London, E.C.1 (01-253 7573).

N. H. Macdonald
MacCarthy Services Ltd., 15 Sandhill, Newcastle-upon-Tyne 1.

Dron & Dickson Ltd.
31 Kelvin Grove Street, Glasgow, C.3 (*industrial dust recovery and fume clearing plant*).

Chemical Construction (G.B.) Ltd.
Regal House, Twickenham, Middx (01-892 4455) (*Pease Anthony scrubbers*).

Drummond Dust & Fume Extractors Ltd.
Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (01-527 4441).

Duscon Engineering Ltd.
P.O. Box 8, Berry Hill, Droitwich, Worcs. (Droitwich 3631 (4 lines)).
44 Queen Elizabeths Walk, Wallington, Surrey (Wallington 4154) (*Dusmat, Dusclone, Duspak, Duspray, Dumist*).

Head Wrightson Process Engineering Ltd.
P.O. Box 13, Teesdale Works, Stockton-on-Tees, Teesside, England (OMH 2 62241).

W. C. Holmes & Co. Ltd.
Turnbridge, Huddersfield (Huddersfield 31651).
16 St. James's Street, London, S.W.1.

Kavag-Uop Air Correction Co. Ltd.
11-12 Pall Mall, London, S.W.1 (01-930 7911).
Somerset House, George Street, Halifax, Yorks. (0422 65109) (*air correction equipment*).

Lodge-Cottrell Ltd.
George Street Parade, Birmingham 3 (021-CEN 3388).
London Office: Simon House, 28/29 Dover Street, London, W.1 (01-493 8191).

Mikropul Ltd.
40 Towerfield Road, Shoeburyness, Essex Shoeburyness 2373-5) (*"Mikro"*).

Western Precipitation Division Joy Trading Corporation
7 Harley Street, London, W.1 (01-580 7711) (*Electrostatic Precipitators, Thermoflex Glass Bag Filters, Multiclone mechanical collectors, Turbulaire Scrubbers, Joy Microdyne scrubbers, Dust Valves*).

GRILLES, LOUVRES, ETC.

A. H. Bibbey Ltd.
High Lane, Stansted, Essex (Stansted 2611/5) (*Husqvarna Heating Appliances*).

GRIT ARRESTERS

Alldays & Onions Ltd.
P.O. Box 234, Great Western Works, Sydenham Road, Birmingham 11 (021-772 2551/4).

Ambuco Ltd.
38-40 Featherstone Street, London, E.C.1 (01-253 7573).
N. H. Macdonald
MacCarthy Services Ltd., 15 Sandhill, Newcastle-upon-Tyne 1.
Dron & Dickson Ltd.
31 Kelvin Grove Street, Glasgow C.3 (*industrial dust recovery and fume clearing plant*).

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook, Bucks. (Colnbrook 2185) (*Pithers Radiant Stoves*).

Bigwood Dust Control
Wednesfield Road, Wolverhampton, Staffs. Wolverhampton 24771) (*Dust collection equipment*).

Buell Ltd.
George Street Parade, Birmingham 3 (021-236 5391) (*Buell industrial drying dust collection and powder classification plants*).

Combustion Equipment Ltd.
Bloors Lane, Rainham, Gillingham, Kent (Medway 32234-6) (*"Cory" grit arrester, "Airlok" and "Interlok" dampers*).

Fan Application & Engineering Ltd.
76 Rivington Street, London, E.C.2 (01-739 9329).

Fan Systems Ltd.
2 Brazil Street, Manchester 1, Lancs. (061-236 7156).

W. C. Holmes & Co. Ltd.
Turnbridge, Huddersfield (Huddersfield 31651).
16 St. James's Street, London, S.W.1.

Newell Dunford Engineering Ltd.
143 Maple Road, Surbiton, Surrey (01-546 7799) (*Airmix, Tubix, Thermix*).

Tipton Tub & Tube Co. Ltd.
Bloomfield Road, Tipton, Staffs. (021-557 1011 and 3418).

Western Precipitation Division Joy Trading Corporation
7 Harley Street, London, W.1 (01-580 7711) (*Electrostatic Precipitators, Thermoflex Glass Bag Filters, Multiclone mechanical collectors, Turbulaire Scrubbers, Joy Microdyne scrubbers, Dust Valves*).

HEAT EXCHANGERS

W. H. Dean & Son Ltd.
Accrington Road, Burnley, Lancs. (Burnley 21711).

HEAT PUMPS

M. L. Industrial Products Ltd.
292 Leigh Road, Trading Estate, Slough, Bucks. (Slough 26244 & 23838) (*Worthington*).

HEATERS, AIR

Auto Combustions (London) Ltd.
360-364 Wandsworth Road, London, S.W.8 (01-622 9121) (*Swirlamiser and Autoflame oil burners*).

A. H. Bibbey Ltd.
High Lane, Stansted, Essex (Stansted 2611/5) (*Husqvarna Heating Appliances*).

Hainault Engineering Co. Ltd.
2-6 Fowler Road, Hainault, Ilford, Essex (01-500 1253).
21 Highmoor, Kirkhill, Morpeth, Northumberland (*Hainault—air heaters*).

Harris Engineering Co. Ltd.
Longfield Road, Tunbridge Wells, Kent (Tunbridge Wells 23401).
Stone Yard, Deritend, Birmingham, 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol 8 (Bristol 30371).
75 Piccadilly, Manchester 1 (Central 3546/7).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

Kavag-Uop Air Correction Co. Ltd.
11-12 Pall Mall, London, S.W.1 (01-939 7911).
Somerset House, George Street, Halifax, Yorks. (0422 65109) (*air correction equipment*).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

Wanson Co. Ltd.
7 Elstree Way, Borehamwood, Herts. (01 - 953 7111) (Telex: 261169) (*"Thermobloc" oil- or gas-fired heaters 150,000-16,000,000 Btu/hr.*).

HEATERS—THERMAL FLUID

Wanson Co. Ltd.
7 Elstree Way, Borehamwood, Herts. (01 - 953 7111) (Telex: 261169) (*"Thermopac" oil- or gas-fired heaters 280,000-24,000,000 Btu/hr.*).

HEATERS, WATER

A. H. Bibbey Ltd.
High Lane, Stansted, Essex (Stansted 2611/5) (*Husqvarna Heating Appliances*).

W. H. Dean & Son Ltd.
Accrington Road, Burnley, Lancs. (Burnley 21711).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

HEATING EQUIPMENT, DOMESTIC

A. H. Bibbey Ltd.
High Lane, Stansted, Essex (Stansted 2611/5) (*Husqvarna Heating Appliances*).

Jones & Campbell Ltd.
P.O. Box 36, Torwood Foundry, Larbert, Stirlingshire, Scotland (Larbert 2114, 4 lines) (*"Torglow" and "Torglow" trend room heaters*).

Radiation Central Heating Ltd.
Radiation House, North Circular Road, Willesden, London, N.W.10 (01-459 1234) (*"Heatmaster" "Ductair"*).

Radiation Gas Fires Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

HEATING EQUIPMENT, INDUSTRIAL

Borsari & Co.
8702 Zollikon-Zurich, Switzerland (Zurich 65 86 55) (*fuel oil storage tanks*).

HEATING EQUIPMENT, INDUSTRIAL (PROCESS SPACE)

R. M. Catterson-Smith Ltd.
Adams Bridge Works, South Way, Exhibition Grounds, Wembley, Middx. (01-902 4291) (*electric furnaces*).

Harris Engineering Co. Ltd.
Longfield Road, Tunbridge Wells, Kent. (Tunbridge Wells 23401).
Stone Yard, Deritend, Birmingham 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol 8 (Bristol 30371).
75 Piccadilly, Manchester 1 (Central 3546/7).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

Isopad Ltd.
Barnet By-Pass, Borehamwood, Herts. (01-953 2817) (*electric surface heaters*).

Luwa (U.K.) Ltd.
36-41 High Street, South Norwood, London, S.E.25 (01-653 6515).
96 Chapel Road, Sale, Cheshire (061-962 1468).

Spencer & Halstead Ltd.
Ossett, Yorks. (Ossett 5121).
84 High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031).
Spenstead House, Ashley Road, Epsom (Epsom 27101) (*"Spenstead"*).

HEATING SYSTEMS—OIL

A. H. Bibbey Ltd.
High Lane, Stansted, Essex (Stansted 2611/5) (Husqvarna Heating Appliances).

John Ford Engineers (Plymouth) Ltd.
Hillcrest Works, Oakfield Terrace Road, Cattedown, Plymouth (Plymouth 63351/2).

Harris Engineering Co. Ltd.
Longfield Road, Tunbridge Wells, Kent (Tunbridge Wells 23401).
Stone Yard, Deritend, Birmingham 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol 8 (Bristol 30371).
75 Piccadilly, Manchester 1 (Central 3546/7).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

Hoval Boilers (U.K.) Ltd.
Northway House, High Road, Whetstone, London, N.20 (01-445 0454-7) & (01-445 0092/4)
Works: The Farrar Boiler Works Ltd., Newark-on-Trent, Notts. (*Hoval/Biral*).

HEATING TAPES (ELECTRIC)

Isopad Ltd.
Barnet By-Pass, Borehamwood, Herts. (01-953 2817) (*electric surface heaters*).

HUMIDIFIERS

Heather Filters Ltd.
17 Addiscombe Road, Croydon CR9 2DE (01-686 2411). (*"Satomair"*)

M. L. Industrial Products Ltd.
292 Leigh Road, Trading Estate, Slough, Bucks. (Slough 26244 & 23838) (*Worthington*).

Spencer & Halstead Ltd.
Ossett, Yorks. (Ossett 5121).
84 High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031).
Spenstead House, Ashley Road, Epsom (Epsom 27101) (*"Spenstead"*).

INCINERATORS

Kavag-Uop Air Correction Co. Ltd.
11-12 Pall Mall, London, S.W.1 (01-930 7911).
Somerset House, George Street, Halifax, Yorks. (0422 65109) (*air correction equipment*).

G. F. Rider (Process Plant) Ltd.
Leeds Place Works, Tollington Park, London, N.4 (01-272 0404).

Universal Machinery & Services Ltd.
Viceroy Works, Millshaw, Ring Road, Beeston, Leeds LS11 8EQ (Leeds 73761) (*Universal incinerators*).

Victor Products (Wallsend) Ltd.
G.P.O. Box 10, Wallsend, Northumberland (Wallsend 628331).
50 Pall Mall, London, S.W.1 (01-930 7142).
Victoria Chambers, Dale Road, Matlock, Derbyshire (Matlock 2318) (*Victor incinerators*).

INDICATORS

G.E.C. Power Engineering Ltd.
Witton-Kramer Division, Witton, Birmingham, 6 (021-327 1941) (*photoelectric smoke-detection equipment*).

INSTRUMENTS, GAUGES, METERS, ETC.

Airflow Developments Ltd.
Lancaster Road, High Wycombe, Bucks. (0494 25252).

Elliott Process Automation Ltd.
Head Office (Southern Region and Overseas): Century Works, Lewisham, S.W.13 (01-892 1271) (Telex: 22469) (Cables: Elliotauto London, S.E.13).
Midland Region: 54 College Road, Perry Barr, Birmingham 22B (021-356 5863/9) (Telex: 33764) (Cables: Elliotauto Birmingham).

North East Region: Duke House, Duke Street, Newcastle-upon-Tyne 1 (Newcastle-upon-Tyne (0632) 611181 (Telex: 53276) (Cables: Elliotauto Newcastle-upon-Tyne).

North West Region: Tudor House, Meadway, Bramhall, Stockport, Cheshire (061-439 5000) (Telex: 66358) (Cables: Elliotauto Bramhall).
Scotland: Norfolk House, Princes Square, East Kilbride, Glasgow, Lanarkshire (East Kilbride (03552) 25311/2/3, 28317/8) (Telex: 77708) (Cables: Elliotauto Glasgow).

LECTURE, FILMSTRIPS & NOTES

National Society for Clean Air
Field House, Breams Buildings, London, E.C.4 (01-242 5038) (*clean air notes for teachers and lecturers, leaflets, posters*).

Diana Wyllie Ltd.
3 Park Road, Baker Street, London, N.W.1 (01-723 7333 and 01-723 3330) (*colour filmstrips and lecture notes on air pollution, chronic bronchitis, safety and oil heaters, etc.*).

OIL STORAGE TANKS

Borsari and Co.
8702, Zollikon-Zurich, Switzerland (Zurich 65 86 55) (*reinforced concrete, ceramic tile-lined*).

PAINT SPRAY BOOTHS

Centri-Spray Ltd.
Green Dragon House, 64-70 High Street, Croydon, CR9 ILG, Surrey (01-688 7431) (Telex: 261251).
Centri-Spray G.m.b.H.
Lloyd Haus, Neue Weyerstrasse, Köln 5, West Germany (23 59 28) (Telex: 888 2415).
Centri-Spray S.A.R.L.
88 Avenue Victor Hugo, Paris 16 eme, France (704 3066) (Telex: 62150).

PUMPS

Charles Austen Pumps Ltd.
Petersham Works, 100 Royston Road, Byfleet, Surrey (Byfleet 43224/5) (*"Dymax" small oil-free diaphragm pumps*).

Hoval Boilers (U.K.) Ltd.
Northway House, High Road, Whetstone London, N.20 (01-445 0454-7 & 01-445 0092-4).
Works: The Farrar Boiler Works Ltd., Newark-on-Trent, Notts. (*Hoval/Biral*).

RADIANT HEATING

Chatelaine Ltd.
Carron, Falkirk, Scotland (OFA4 21331).

Richard Haighton Ltd.
Canning Street, Burnley, Lancs. (Burnley 25731/4) (*"Lofire"*).

Harris Engineering Co. Ltd.
Longfield Road, Tunbridge Wells, Kent (Tunbridge Wells 23401).
Stone Yard, Deritend, Birmingham 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol 8 (Bristol 30371).
75 Piccadilly, Manchester 1 (Central 3546/7).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

Radiation Gas Fires Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

REFRIGERATION PLANT

M. L. Industrial Products Ltd.
292 Leigh Road, Trading Estate, Slough, Bucks. (Slough 26244 & 23838) (*Worthington*).

RESEARCH AND DEVELOPMENT FACILITIES

The British Non-Ferrous Metals Research Association
Euston Street, London, N.W.1 (01-387 6411) (Telex: 265094).

Head Wrightson Process Engineering Ltd.
P.O. Box 10, Teesdale Works, Stockton-on-Tees, Teesside, England (OMH 2 62241).

ROOM HEATERS—GAS

Cannon Industries Ltd.
Deepfields, Bilston, Staffs. (Bilston 43161).
4 Old Park Lane, Piccadilly, London, W1Y 3LJ (01-493 4861).

Radiation Gas Fires Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

ROOM HEATERS—OIL

A. H. Bibbey Ltd.
High Lane, Stansted, Essex (Stansted 2611/5) (*Husqvarna Heating Appliances*).

ROOM HEATERS—SOLID FUEL (OPEN FIRES & OPENABLE FIRES)

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook. Bucks. (Colnbrook 2185) (*Pithers Radiant Stoves*).

Richard Haighton Ltd.
Canning Street, Burnley, Lancs. (Burnley 25731/4) (*"Lofire"*).

Jones & Campbell Ltd.
P.O. Box 36, Torwood Foundry, Larbert, Stirlingshire, Scotland (Larbert 2114, 4 lines) (*"Torglow" and "Torglow" trend room heaters*).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234).

SMOKE DENSITY RECORDING

Leeds & Northrup Ltd.
Wharfdale Road, Tyseley, Birmingham 11 (021-706 6171).
20 Peel Street, Kensington, London, W.8 (01-727 2353) (*"Speedomax" indicators, recorders and controllers*).

SMOKE DENSITY GAUGES & METERS

Airflow Developments Ltd.
Lancaster Road, High Wycombe, Bucks. (0494 25252).

Photoelectronics (Arcall) Ltd.
92 Oldfield Road, Sutton, Surrey (01-644 4571) (Telex: 262026).

SMOKE INDICATORS

G.E.C. Power Engineering Ltd.
Witton-Kramer Division, Witton, Birmingham 6 (021-327 1941) *(photoelectric smoke-detection equipment).*

Photoelectronics (Arcall) Ltd.
92 Oldfield Road, Sutton, Surrey (01-644 4571) (Telex: 262026).

Radiovisor Parent Ltd.
Stanhope Works, High Path, London, S.W.19 (01-540 3351).

Ronald Trist Controls Ltd.
Bath Road, Slough, Bucks. (Slough 25041) (*"Electricon" smoke density indicators and alarms*).

STOKERS, INDUSTRIAL

Babcock & Wilcox (Operations) Ltd.
Babcock House, 209 Euston Road, London, N.W.1 (01-387 4321).
Rutland House, 148 Edmund Street, Birmingham 3 (Central 6131).
Aylward House, Wine Street, Bristol 1 (Bristol (C) 294561).
54 West Nile Street, Glasgow C.1 (Central 9932).
Peter House, Oxford Street, Manchester 1 (061-236 8326).
Stonebow House, The Stonebow, York (York 58645).

Edwin Danks & Co. (Oldbury) Ltd.
P.O. Box 4, Oldbury, Warley, Worcs. (021-552 2531).

Scriven-Crosthwaite Ltd.
York Street, Leeds LS9 8AQ (0532 32411/2) (Grams: Scriven, Leeds 9) (*Forced Draught Furnaces*).

STOVES, ANTHRACITE

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook, Bucks. (Colnbrook 2185) (*Pithers Radiant Stoves*).

THERMAL STORAGE SYSTEMS

Metro-Flex Group of Companies
Metro-Flex Works, Earl Cottages, Earl Road, London, S.E.1 (01-237 4331) (*"Metro-Flex"*).

THERMOMETERS, INDICATORS, ETC.

Elliott Process Automation Ltd.
Head Office (Southern Region and Overseas): Century Works, Lewisham, S.E.13 (01-892 1271) (Telex: 22469) (Cables: Elliotauto London, S.E.13).
Midland Region: 54 College Road, Perry Barr, Birmingham, 22B (021-356 5863/9) (Telex: 33764) (Cables: Elliotauto Birmingham).
North East Region: Duke House, Duke Street, Newcastle-upon-Tyne 1 (Newcastle-upon-Tyne (0632) 611181) (Telex: 53276) (Cables: Elliotauto Newcastle-upon-Tyne).

North West Region: Tudor House, Meadway, Bramhall, Stockport, Cheshire (061: 439 5000) (Telex: 66358) (Cables-Elliotauto Bramhall).
Scotland: Norfolk House, Princes Square, East Kilbride, Glasgow, Lanarkshire (East Kilbride (03552) 25311/2/3, 28317/8) (Telex: 77708) (Cables: Elliotauto Glasgow).

THERMOSTATIC RADIATOR VALVES

Hoval Boilers (U.K.) Ltd.
Northway House, High Road, Whetstone, London, N.20 (01-445 0454-7 & 01-445 0082-4).
Works: The Farrar Boiler Works Ltd., Newark-on-Trent, Notts. (*Hoval/Biral*).

VENTILATORS

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook, Bucks. (Colnbrook 2185) (*Pithers Radiant Stoves*).

Marshall & Parsons Ltd.
1111 London Road, Leigh-on-Sea, Essex (Southend 74867) (*"Draught Master"*).

WARM AIR HEATING SYSTEMS

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook, Bucks. (Colnbrook 2185) (*Pithers Radiant Stoves*).

A. H. Bibbey Ltd.
High Lane, Stansted, Essex (Stansted 2611/5) (*Husqvarna Heating Appliances*).

Constant Air Systems Ltd.
Raebarn House, Northolt Road, Harrow, Middlesex (01-864 0288).
Wolverley House, Digbeth, Birmingham 5 (021-643 5148).

Fan Application & Engineering Ltd.
76 Rivington Street, London, E.C.2 (01-739 9329).

John Ford Engineers (Plymouth) Ltd.
Hillcrest Works, Oakfield Terrace Road, Cattedown, Plymouth (Plymouth 63351/2).

Hainault Engineering Co. Ltd.
2-6 Fowler Road, Hainault, Ilford, Essex (01-500 1253).
21 Highmoor, Kirkhill, Morpeth, Northumberland (*Hainault—air heaters*).

Harris Engineering Co. Ltd.
Longfield Road, Tunbridge Wells, Kent (Tunbridge Wells 23401).
Stone Yard, Deritend, Birmingham 12 (Midland 9536/7).
19-20 Elmdale Road, Bristol 8 (Bristol 30371).
75 Piccadilly, Manchester 1 (Central 3546/7).
Wellington House, 103/105 Pilgrim Street, Newcastle-upon-Tyne (Newcastle 24401).
Killowen Street, Coleraine, Northern Ireland (Coleraine 2315/6) (Telex: 74621) (*manufacturers of industrial space heating and air cleaning equipment*).

Radiation Central Heating Ltd.
Radiation House, North Circular Road, Willesden, London, N.W.10 (01-459 1234) (*"Heatmaster" "Ductair"*).

Wanson Co. Ltd.
7 Elstree Way, Borehamwood, Herts. (01-953 7111) (Telex: 261169) (*"Thermobloc" oil- or gas-fired heating systems*).

WASTE FUEL BOILER PLANT

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook, Bucks. (Colnbrook 2185) (*Pithers Radiant Stoves*).

G. F. Rider (Process Plant) Ltd.
Leeds Place Works, Tollington Park, London, N.4 (01-272 0404).

WASTE HEAT RECOVERY

A.P.L. Engineering Ltd.
Polygon Works, Poyle Trading Estate, Poyle Road, Colnbrook, Bucks. (Colnbrook 2185) (*Pithers Radiant Stoves*).

Duscon Engineering Ltd.
P.O. Box 8, Berry Hill, Droitwich, Worcs. (Droitwich 3631, 4 lines).
44 Queen Elizabeths Walk, Wallington, Surrey (Wallington 4154) (*Dusmat, Dusclone, Duspak, Duspray, Dumist*).

Universal Machinery & Services Ltd.
Viceroy Works, Millshaw, Ring Road, Beeston, Leeds LS11 8EQ (Leeds 73761) (*Universal incinerators*).

WASTE MATERIAL DISPOSAL FURNACES

Combustion Equipment Ltd.
Bloors Lane, Rainham, Gillingham, Kent (Medway 32234/6) (*"Cory" grit arrester, "Airlok" and "Interlok" dampers*).

Universal Machinery & Services Ltd.
Viceroy Works, Millshaw, Ring Road, Beeston, Leeds LS11 8EQ (Leeds 73761) (*Universal incinerators*).

WET ARRESTERS

Bigwood Dust Control
Wednesfield Road, Wolverhampton Staffs. (Wolverhampton 24771) (*Dust collection equipment*).

Buell Ltd.
George Street Parade, Birmingham 3 (021-236 5391) (*Buell industrial drying dust collection and powder classification plants*).

Centri Spray Ltd.
Green Dragon House, 64-70 High Street, Croydon, CR9 1LG Surrey (01-688 7431) (Telex: 261251).
Centri-Spray G.m.b.H.
Lloyd Haus, Neue Weyerstrasse, Köln 5, W. Germany (23 59 28) (Telex: 8882415).
Centri-Spray S.A.R.L.
88 Avenue Victor Hugo, Paris 16 eme, France (704 3066) (Telex: 62150).

Drummond Dust and Fume Extractors Ltd.
Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (01-527 4441).

Duscon Engineering Ltd.
P.O. Box 8, Berry Hill, Droitwich, Worcs. (Droitwich 3631) (4 lines).
44 Queen Elizabeths Walk, Wallington, Surrey (Wallington 4154) (*Dusmat, Dusclone, Duspak, Duspray, Dumist*).

Newell Dunford Engineering Ltd.
143 Maple Road, Surbiton, Surrey (01-546 7799) (*Airmix, Tubix, Thermix*).

Serck Visco
161 Stafford Road, Croydon, CR9 4DT, Surrey (01-686 3861/9) (*"Visco"*).

Spencer & Halstead Ltd.
Ossett, Yorkshire (Ossett 5121).
84 High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031).
Spenstead House, Ashley Road, Epsom (Epsom 27101) (*"Spenstead"*).

Wellman Incandescent Furnace Co. Ltd.
Cornwall Road, Smethwick, Warley, Worcs. (021-558 3151) (*Incandescent/White Wet Arresters for cupolas*).

Western Precipitation Division Joy Trading Corporation
7 Harley Street, London, W.1 (01-580 7711) (*Electrostatic Precipitators, Thermoflex Glass Bag Filters, Multiclone mechanical collectors, Turbulaire Scrubbers, Joy Microdyne scrubbers, Dust Valves*).

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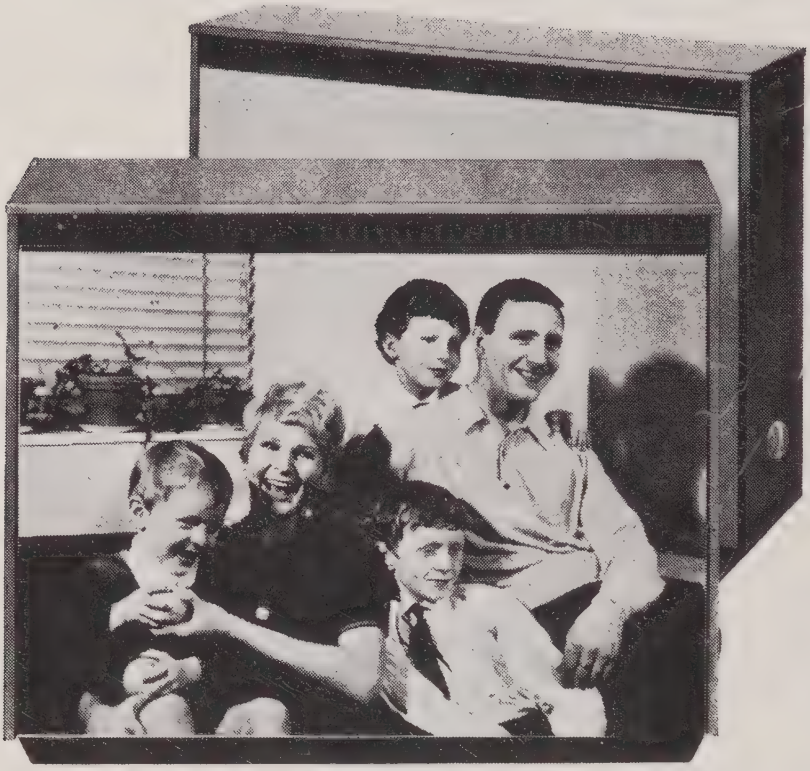

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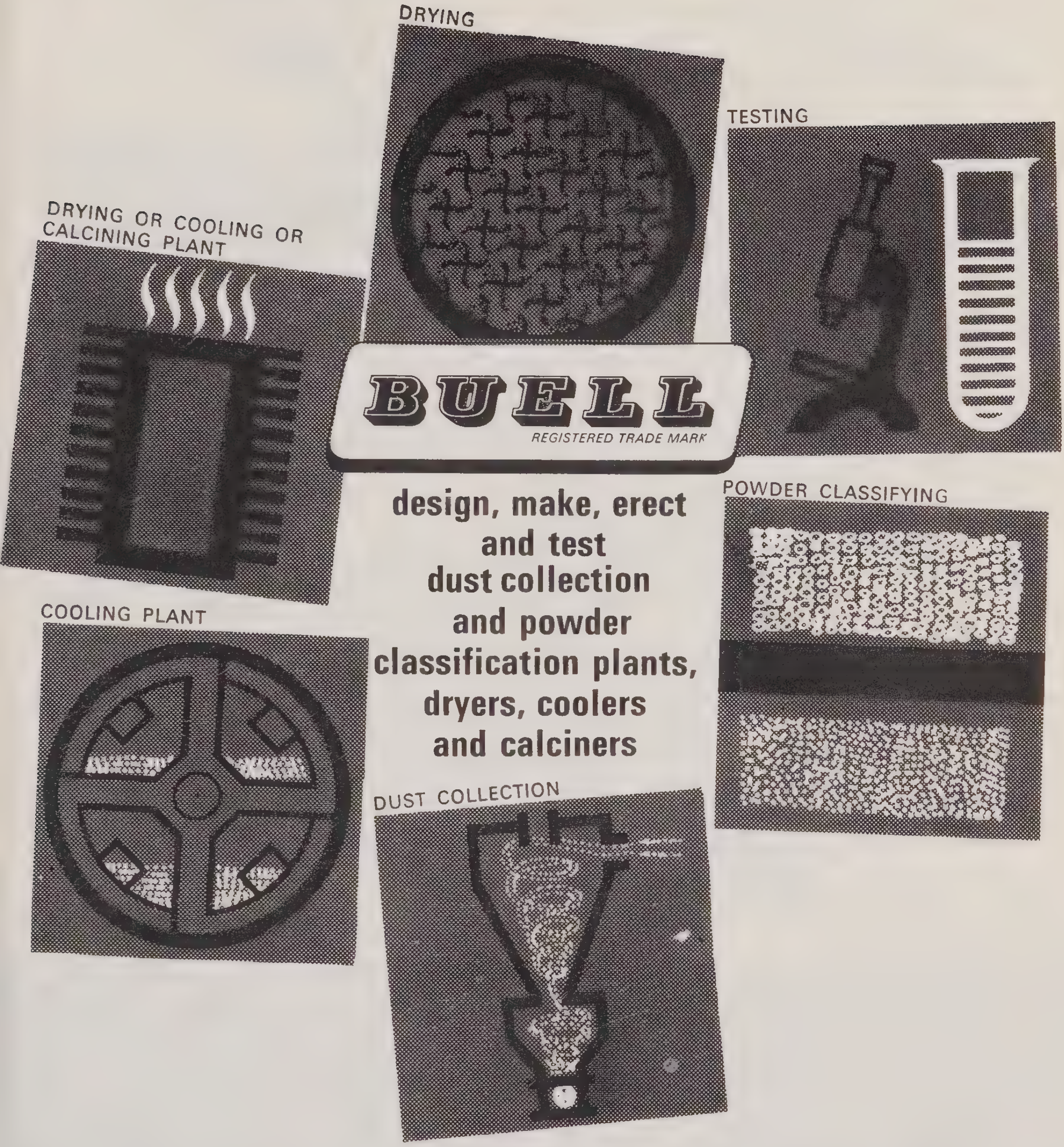
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High efficiency dust collection plants are designed incorporating Buell-Van Tongeren cyclones. Designs are available to meet the requirements of individual industries and to comply with the Clean Air Act.

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Coolers are designed and installed for lowering the temperature of materials without using large volumes of air.

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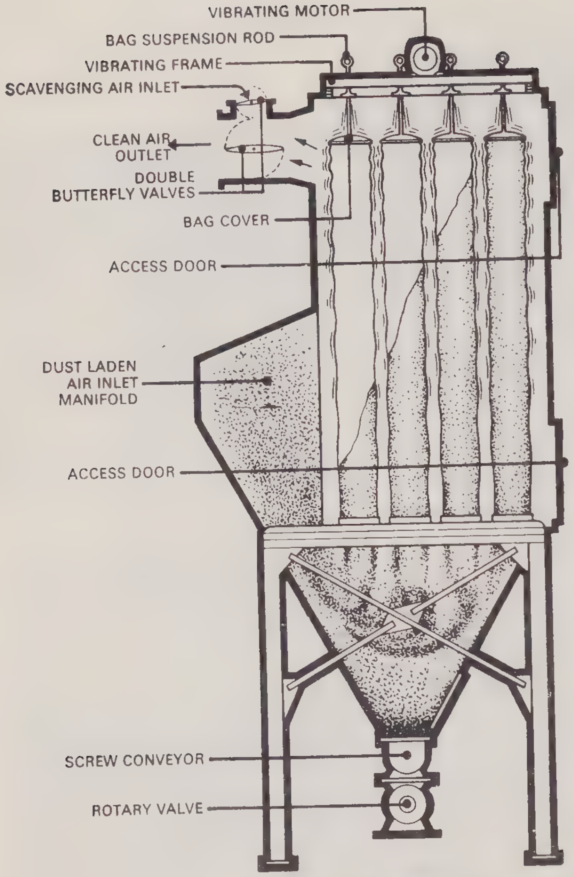
HOW BIG IS YOUR DUST PROBLEM?



Section of Vibro Chamber Filter

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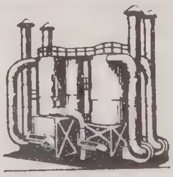
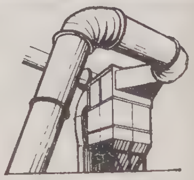
99% efficiency — 0·005 microns and above	99% efficiency — 0·5 microns and above	99% efficiency — 3 microns and above	95% efficiency — 10 microns and above
 Electrical Precipitators	*Holmes are equipped to deal with any dust collection problem*	 Wet Arrestors	 Multi-cell Cyclones

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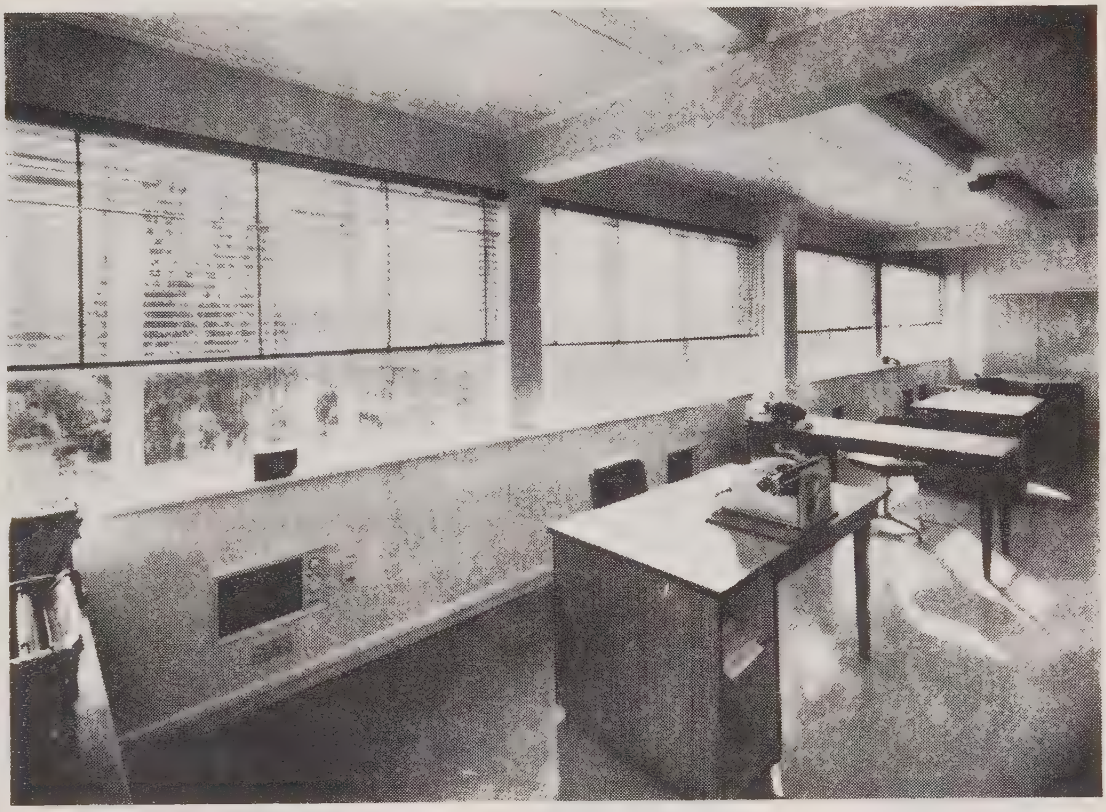

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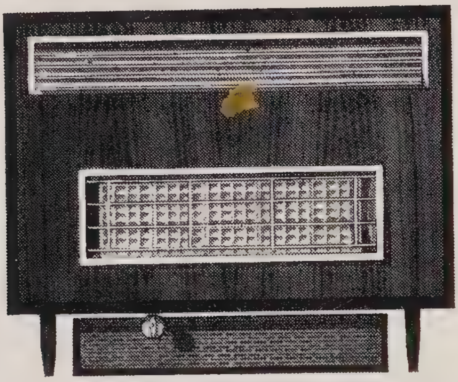

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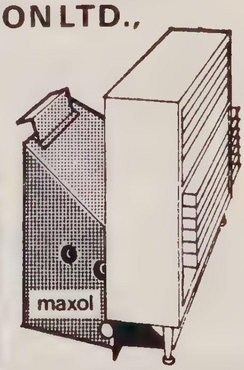
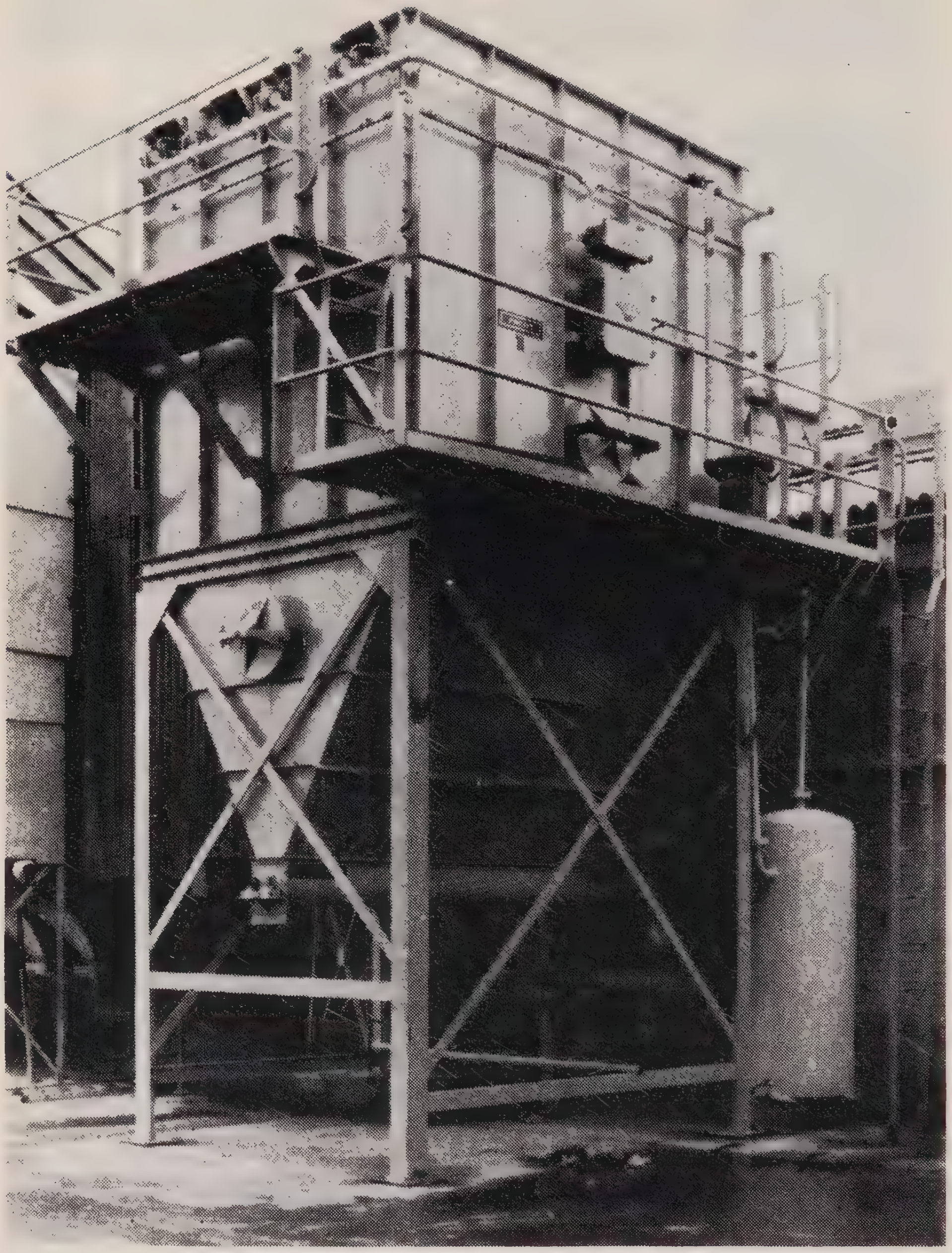


lx3224 Tm6 MU19/26



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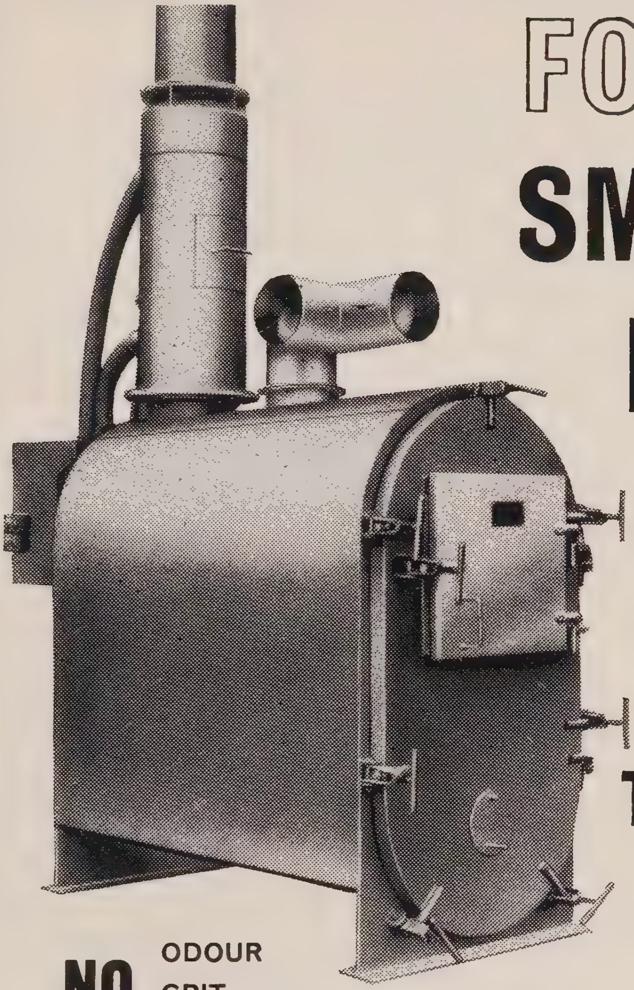

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970-1971

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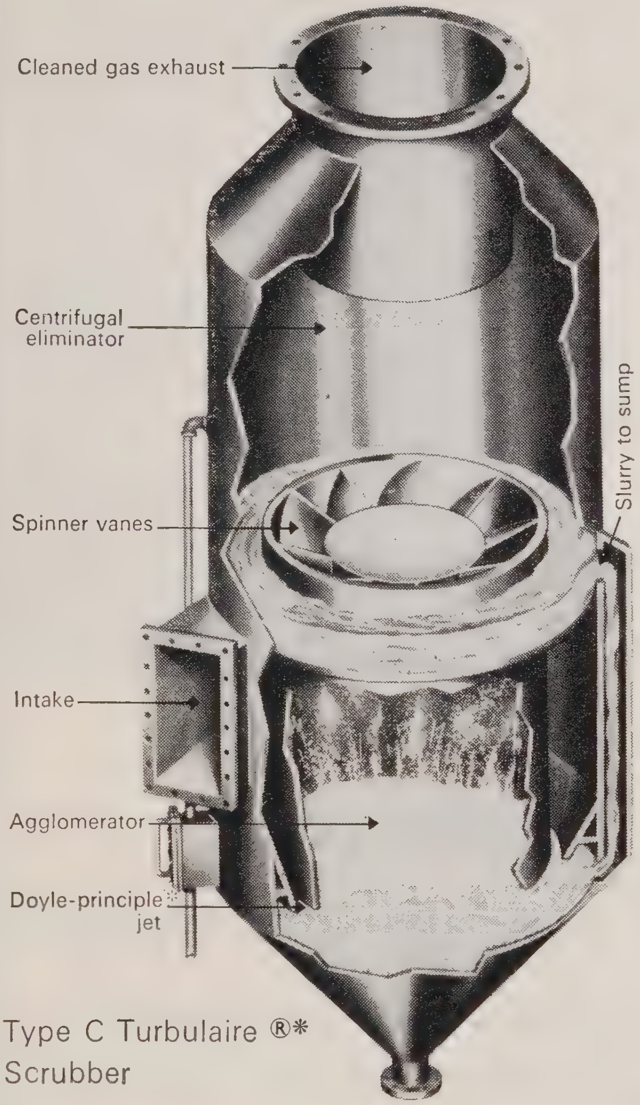

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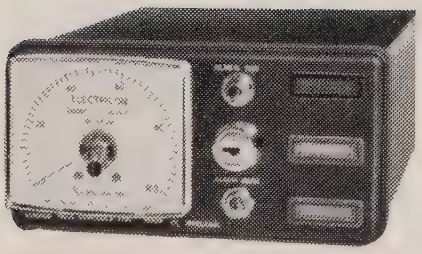

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for the MODERN HOME or OFFICE

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Illustrations showing the MH 4 in an office and in the home

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CLEAN AIR YEAR BOOK

1970—1971

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The Cover Photograph—This photograph is reproduced by the kind courtesy of the Daily Telegraph, and shows Buckingham Palace after cleaning.

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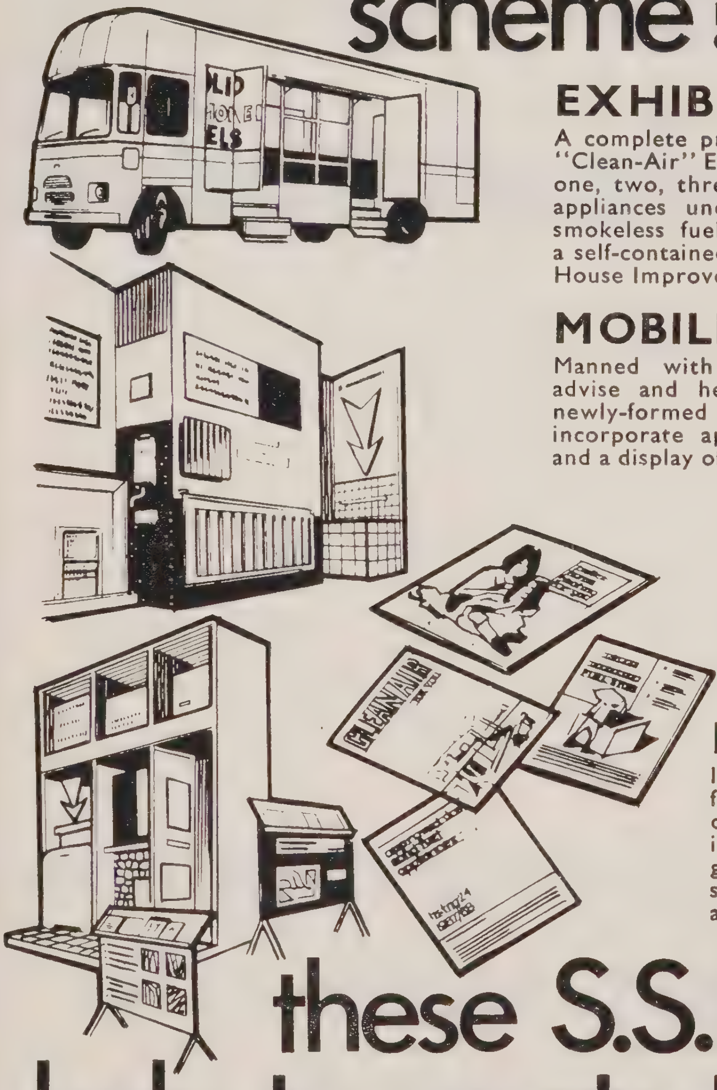

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Clean Air Progress

A Review for 1969/70

The period under review promised to be a good year so far as clean air was concerned, in that on the 1st October 1969, those clauses of the 1968 Act which had not been brought into force in the previous April were enacted. This Act providing as it did, powers for the Minister of Housing and Local Government to compel laggard authorities to implement smoke control programmes, could have given a great fillip to the clean air movement as a whole. Unfortunately, the Minister has not yet been able to exercise these powers.

Indeed, in 1970, in Conservation Year, when anti-pollution was becoming fashionable, when every newspaper in the land was inveighing against pollution, when television and radio made a tremendous point about all this, clean air suffered a grave set-back. In the autumn of 1969 it was becoming clear that in certain areas at any rate, the supplies of solid smokeless fuel might well be critical. In fact, in certain places the supplies not only became critical, but were non existent, and by the end of 1969 this compelled 16 local authorities to seek powers of suspension of smoke control orders from the Ministry of Housing and Local Government.

Unfortunately, worse was to follow. As time went on it was announced that the position would not be righted in time for the winter of 1970/71. In fact, announcements were made that the supplies of solid smokeless fuels would be critical during the following winter and Lord Robens, the Chairman of the National Coal Board, went so far as to suggest that the Government should not authorise any further smoke control areas being brought into operation until solid smokeless fuel was available.

The causes of this failure in the supply of solid smokeless fuel are obscure. The solid fuel industry have blamed the gas industry for running down too quickly the old coal-gas works which produced coke because of the rapid spread of natural gas. The gas industry, in their turn, have said that the more rapid coming of natural gas has made very little difference to a programme which had been announced some years previously. Whatever the cause, the effect has been that many places which were early to implement a smoke control programme and which relied to a large extent on the solid smokeless fuel, have suffered.

The Government have taken limited action in suspending temporarily the closure of a number of gas works. This is a step in the right direction, but is no more than a drop in the ocean and will only have effect locally. Much more positive action is required in the shape of the formulation of a fuel policy which will ensure that clean air progress is not impeded.

The immediate requirement is to ensure that existing supplies of solid smokeless fuel are made available to those authorities with smoke control areas which depend on this fuel. So far as new areas are concerned it is not essential that they use solid smokeless fuel: other fuels are available and there is no need to impede or halt the progress of smoke control.

In spite of this set-back, which all concerned with clean air and a better environment hope will be no more than temporary, 296 new smoke control orders were brought into operation during the period under review. This compares not unfavourably with the figure of 308 for the previous year. But it still continues the downward curve which was reported in the last issue of the Clean Air Year Book.

In the circumstances, this is hardly surprising. But there are still many local authorities who are trying to get ahead with their smoke control programmes. It is to be hoped that they will be permitted to implement their programmes without further delay, so that next year the curve will start to climb once again.

The National Industrial Fuel Efficiency Service

N.I.F.E.S. provides a complete consulting engineering service covering all aspects of energy utilisation and associated pollution problems. Instrumented surveys are used to show by precise measurement how systems can be operated efficiently at minimum cost, and a regular service is provided to establish and maintain maximum efficiency. A full consulting service is provided for the design and specification of new buildings and ancillary services.

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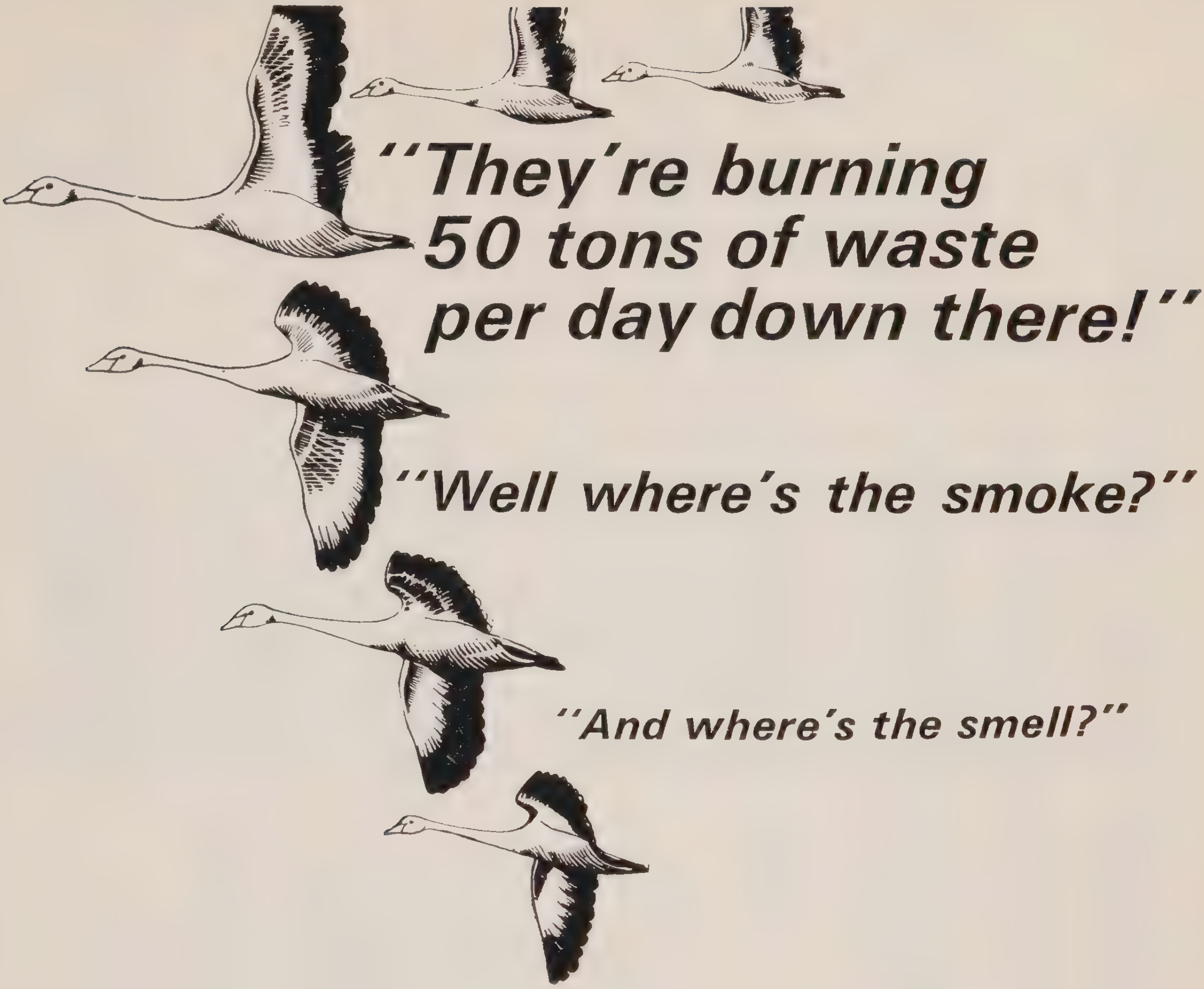
"They're burning 50 tons of waste per day down there!"
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AIR POLLUTION RESEARCH PROGRAMME IN THE UNITED KINGDOM

The following information is published by courtesy of the Interdepartmental Committee on Air Pollution Research, and is largely based on information suppled by the research organisations involved.

The table lists all research known to be in progress in 1969 and either partly or wholly funded by the government. It also includes some industrial organisations known to be concerned with air pollution research, but no attempt has been made to make it complete in this respect.

The programmes are arranged by subject in five parts, viz:
Part 1: Abatement of Emissions of Pollutants
Part 2: Dispersion and Distribution of Pollutants
Part 3: Effects on Health
Part 4: Effects on Animal Life, Vegetation and Materials
Part 5: Measurement Methods

Problem	*Investigation*	*Organisation*	*Officer Responsible*
Part 1. Abatement of Emissions of Pollutants			
1.1 Sulphur compounds	(a) Removal from natural gas and residual fuel oils	University of Strathclyde, Dept. of Pure and Applied Chemistry, Glasgow, C.1.	—
	(b) Development of absorbents for removal of SO_2 from flue gases	C.E.G.B.	—
	(c) Removal from gases in fluid bed combustion systems:		—
	(i)	B.C.U.R.A.	—
	(ii) retention of sulphur by addition of limestone and suppression of nitrogen oxides	N.C.B., Coal Research Establishment	—
1.2 Oxides of nitrogen (see also 1.13)	(a) Formation in combustion systems	University of Sheffield, Dept. of fuel technology and Chemical Engineering, Newcastle Street, Sheffield, 1, Yorks.	Dr. A. B. Hedley Dr. E. Rothwell

Problem		Investigation	Organisation	Officer Responsible
1.3 Grit and dust	(a)	Improvement in electrostatic precipitation	C.E.G.B.	—
	(b)	Reduction of pollution due to ash disposal	do.	—
	(c)	Identification of grit and dust	W.S.L.	—
	(d)	Measurement of emission from chimneys	do.	—
	(e)	Dust in foundries: variation in concentration and characteristics; sampling methods; exhaust systems; improvement in ventilation standards	Steel Castings Research and Trade Association, East Bank Road, Sheffield, 2, Yorks.	Dr. H. T. Hall (Director)
	(f)	Iron and steel works: development of fumeless steel making techniques (N.B. R. & D. Depts of B.S.C. operating groups also carry out investigations, e.g. on cleaning installation design and efficiency, surveys of fume and dust deposition round works)	British Iron and Steel Research Association/Inter-Group Laboratories of British Steel Corporation, P.O. Box 403, 33 Grosvenor Place, London, S.W.1.	G. E. Speight
	(g)	Dust in coal mining, composition and distribution	N.C.B. Pneumoconiosis Field Research	—
	(h)	Dust control	N.C.B., Mining Research and Development Establishment	—
	(j)	Development of mechanised ash removal systems	B.C.U.R.A.	—
1.4 Air pollution from combustion	(a)		London University: University College, Dept. of Mechanical Engineering, Gower Street, London, W.C.1.	Professor H. Billett
	(b)	Provision of field team	B.C.U.R.A.	—
1.5 Oil-fired appliances	(a)	Emission from appliances ranging from space heaters to power station boilers, steel and chemical manufacturing plant	Esso Petroleum Co. Ltd, Esso Research Centre, Abingdon, Berks.	The Director of Research
1.6 Industrial Chimneys	(a)	Emissions: measurement (and advice on control)	B.C.U.R.A.	—
1.7 Liquid and gaseous petroleum fuel-fired combustion equipment	(a)	Study of combustion in continuous domestic and industrial combustion appliances; effect of fuel, design and operating conditions on emissions	Shell Research Ltd, Central Laboratories, Whitehall Lane, Egham, Surrey	The Director

Problem	Investigation	Organisation	Officer Responsible
	(b) Development of equipment for determination in field work of, e.g. exhaust carbon concentration SO_2/SO_3 level, unburnt hydrocarbons in domestic exhaust gases	do.	—
1.8 Brickworks, etc.	(a) Identification of stages of cycle at which pollutants (fluorine, oxides of sulphur, obnoxious smell) are emitted; identification of compounds and mechanisms responsible for smell; removal of odours and noxious components from waste gas	W.S.L.	—
	(b) Reduction of smoke during firing of blue engineering bricks, roofing tiles and floor quarries, of fume during salting period in firing salt-glazed pipes, of acid soot and fumes especially from oil-fired kilns and/or when firing suphur-bearing clays in the structural ceramic and refractories industry and of fluorine from pottery kilns, overcoming health hazard from dust in clay industries	British Ceramic Research Association, Queens Road, Penkhull, Stoke-on-Trent, Staffs.	Dr. N. F. Astbury, C.B.E., (Director)
1.9 Welding and flame cutting	(a) Study of toxic thermal degradation products	University of Newcastle upon Tyne, Dept. of Industrial Health, Newcastle upon Tyne, 1 Northumberland	Professor R. C. Browne
1.10 Coking plant	(a) Reduction of smoke emissions during oven charging; measurement and abatement of pollutants from coking plant	British Coke Research Association, Coke Research Centre, Chesterfield, Derbyshire	Dr. G. W. Lee (Director)
1.11 Industrial plant, especially copper and aluminium works	(a) Measurement of emissions to atmosphere; fume collection	British Non-ferrous Metals Research Association, Euston Street, London, N.W.1.	Dr. A. J. Kennedy, (Director)

Problem	*Investigation*	*Organisation*	*Officer Responsible*
1.12 Persistent industrial mists	(a) (i) Investigation of the geographical distribution of mist on Teesside and the correlation between visibility, chemical composition of the atmospheric aerosol and other meteorological factors; (ii) measurement of ammonia and SO_2 levels on Teesside to study the kinetics of their conversion to ammonium sulphate, a major contribution to the mist; identification of the meteorological and other factors which assist the conversion; (iii) comparison measurements of ammonia, SO_2, ammonium sulphate and other particulates at other sites in the country; (iv) laboratory investigations of the kinetics of both the homogeneous and heterogeneous formation of ammonium sulphate from ammonia and SO_2	A.E.R.E.	—
1.13 Motor vehicles	(a) Diesel smoke: (i) measurement and reduction	W.S.L., M.I.R.A.	— —
	(ii) elimination	London University: Queen Mary College, Dept. of Mechanical Engineering, Mile End Road, London, E.1.	Professor M. W. Thring
	(b) Control of diesel exhaust gases;	British Internal Combustion Engine Research Institute Ltd, 111-112 Buckingham Avenue, Slough, Bucks.	The Director
	(c) Effect of petrol injection on exhaust pollution	Plymouth College of Technology, Dept. of Mechanical Engineering, Plymouth, Devon	E. C. Thomasson F. J. Woodgate
	(d) Exhaust emissions from petrol engines: effect of mixture preparation and combustion chambers on single cylinder engine; control of nitrogen oxides by M.I.R.A. exhaust recirculation; assessment of different measuring procedures	M.I.R.A.	—

Problem		*Investigation*	*Organisation*	*Officer Responsible*
	(e)	Catalytic devices for control of car engine exhausts	Laporte Industries Ltd, General Chemicals Division (incorporating Peter Spence & Sons Ltd, Widnes, Lancs.)	The Manager of Research
	(f)	Effect of internal combustion engine fuels and operating conditions on exhaust gas characteristics; cleaning devices	(1) Esso Petroleum Co. Ltd, Esso Research Centre, Abingdon, Berks. (2) Shell Research Ltd, Thornton Research Centre, P.O. Box 1, Chester	The Director of Research The Development Director
	(g)	Emissions from vehicles; examination	British Petroleum Co., Petroleum Division, Research Centre, Chertsey Road, Sunbury-on-Thames, Middlesex	The Manager
1.14 Aircraft (see also 5(m))	(a)	Production and consumption of pollutants from rich hydrocarbon/air flames, at high pressures, with particular reference to aircraft gas turbine conditions	National Gas Turbine Establishment, Pyestock, Farnborough, Hants.	D. I. Dawton
1.15 Domestic smoke	(a)	Production of solid smokeless fuels: production scale work on carbonisation of small coal in a fluidised bed followed by briquetting of char without a binder, and on briquetting of coal with pitch, followed by a mild heat treatment	(1) N.C.B., Coal Research Establishment (2) B.C.U.R.A.	— —
	(b)	Development of domestic appliances (room heaters and domestic central heating boilers) for burning small graded bituminous coal smokelessly	N.C.B., Coal Research Establishment	—
	(c)	Measurement of smoke emission from solid fuel-fired appliances and from manufactured solid fuels	(1) N.C.B., Coal Research Establishment (2) B.C.U.R.A.	— —

Problem		*Investigation*	*Organisation*	*Officer Responsible*
Part 2. Dispersion and Distribution of pollutants				
2.1 Study of dispersion of chimney gases in order to minimise pollution by correct design and siting of chimneys	(a)	High isolated chimneys: surveys round power stations	C.E.G.B.	—
	(b)	High chimneys in built-up areas: wind tunnel and full scale studies	C.E.G.B.	—
	(c)	Chimney design in relation to nearby buildings: comparison of wind tunnel and full scale tests	W.S.L.	—
	(d)	Ships' funnels and industrial chimneys; wind tunnel tests	National Physical Laboratory, Aerodynamics Division, Teddington, Middlesex	Dr. R. C. Pankhurst (Superintendent)
	(e)	Contribution of multi-industrial boilers (including refineries) to ground level pollution, computer prediction of relationships between chimney heights, meteorological conditions and g.l.c. of SO_2	Esso Petroleum Co. Ltd, Esso Research Centre, Abingdon, Berks.	The Director of Research
	(f)	Liquid model experiments on instantaneous or continued sources under various conditions of atmospheric stratification	Loughborough University of Technology, Dept. of Electrical Engineering, Loughborough, Leics.	Dr. J. M. Richards
	(g)	Studies involving release of tracer from or near the ground, and sampling resulting distribution with collectors on the ground on or ballon cables	W.S.L.	—
	(h)	Study of discharge characteristics of low-level flue terminals	Gas Council, 4/5 Grosvenor Place, London, S.W.1.	T. E. D. Mason (Secretary)
	(j)	Wind tunnel tests with variation of wind and temperature profiles	Brighton College of Technology Dept. of Applied Physics, Brighton, Sussex	P. Bradshaw

Problem	*Investigation*	*Organisation*	*Officer Responsible*
2.2 Studies of dispersion and of meteorological factors in the upper air over town and country	(a) Studies of diffusion of particulate matter using lidar	W.S.L.	—
	(b) Study of atmospheric turbulence and convection in first few thousand feet above ground, using instruments on towers or on tethered ballons; study of vertical temperature, wind and humidity up to 4,000 ft. using radiosondes, free or on tethered balloons	Met. Office	—
2.3 Studies of dispersion on global scale	(a) Monitoring of radioactive debris from nuclear explosions	A.E.R.E.	—
	(b) Application of radioactive techniques to, e.g. diffusion in stratosphere	do.	—
2.4 Distribution of pollutants throughout Great Britain, especially in relation to application of the Clean Air Act	(a) The National Survey of Smoke and Sulphur Dioxide	W.S.L., in cooperation with Local Authorities, the C.E.G.B. and other organisations	—
2.5 Distribution of pollution in urban areas in relation to meteorological and geographical factors and to the needs of medical investigators, town planners, etc.	(a) Sheffield	Sheffield University, Dept. of Geography, Western Bank, Sheffield, 10, Yorks and:	Professor Alice Garnett

Problem	*Investigation*	*Organisation*	*Officer Responsible*
	(i) (Contract ended June 1969)	(i) W.S.L.	—
	(ii)	(ii) Centre for Environmental Studies	—
	(iii) Study of incidence of pulses of high SO_2 concentrations, emission in Don Basin, and correlation with absence from work due to respiratory infection	(iii) Gas Council	—
	(b) Edinburgh (with grant from W.S.L.)	Edinburgh University, Dept. of Geography, High School Yards, Edinburgh, 1	Dr. A. J. Crosbie
	(c) London: (i) using National Survey and additional air pollution data;	W.S.L.	—
	(ii) with particular reference to temperature and application of trend surface analysis;	London University: University College, Dept. of Geography, Gower Street, London, W.C.1.	Professor T. J. Chandler
	(iii) continuous survey at 27 sites; study of pollution in relation to high buildings; traffic pollution in tunnels; air-borne radio-active pollution	Greater London Council, Scientific Branch, County Hall, London, S.E.1.	The Chief Scientific Advisor
	(d) Reading, with particular reference to meteorological factors	University of Reading, Dept. of Geography, Reading Berks.	M. Parry
	(e) Brighton, with particular reference to temperature	London University: University College. Dept. of Geography, Gower Street, London, W.C.1.	Professor T. J. Chandler
	(f) Special surveys to give basic information for planning and for evaluation of town surveys	W.S.L.	—
	(g) Pollution in City streets: (i) and other environmental conditions in streets;	London University: Imperial College of Science and Technology, Dept. of Civil Engineering (Transport), Prince Consort Road, London, S.W.7.	D. H. Crompton
	(ii) carbon monoxide (in six towns)	W.S.L.)	—

Problem	Investigation	Organisation	Officer Responsible
	(h) Diffusion and removal of pollution: (i) natural removal indoors; (ii) pulses of concentration and atmospheric turbulence	London University: Imperial College of Science and Technology, Dept. of Chemical Engineering, Prince Consort Road, London, S.W.7.	Dr. M. J. G. Wilson
2.6 Air pollution in relation to climate etc.	(a) Teesside and County Durham	University of Durham, Dept. of Geography, Science Laboratories, South Road, Durham City, Co. Durham	Professor W. B. Fisher
	(b) Measurement of radioactive properties of cloud, fog and haze	N.E.R.C. and Oxford University	—
	(c) Relationship between visibility, relative humidity, droplet population and particulate pollutants	A.E.R.E.	—
2.7 Pollutants in remote areas	(a) Suphur, chlorine, sodium, potassium, calcium, magnesium, ammonia, in air and in rain; NO_3 and H_2CO_3 in rain; measurements at three sites	Met. Office (analysis by the Laboratory of the Government Chemist)	—
	(b) Sulphur dioxide and smoke in air	W.S.L.	—
	(c) Aerobiology in relation to forest disease development (dispersal of fungus spores)	N.E.R.C. and Oxford University	—
	(d) Effects of forest stands on drifting polluted air	Portsmouth College of Technology, Dept. of Biological Sciences, Hampshire Terrace, Portsmouth Hants.	F. N. Haynes
2.8 Life-history of pollutants in the atmosphere	(a) Laboratory studies of SO_2 oxidation in air and in the presence of particulates, droplets and ammonia, using radioactive SO_2 (see also 1.12a (iv)); absorption of SO_2 on particulate aerosols and its relation to possible synergistic effects on inhalation	A.E.R.E.	—
	(b) Interaction of pollutants, including SO_2, with aerosols	University of Sheffield, Dept of Fuel Technology, Newcastle Street, Sheffield 1, Yorks.	Professor J. M. Beer

Problem	*Investigation*	*Organisation*	*Officer Responsible*
2.9 Bactericidal properties of pollutants	(a) Studies of bactericidal properties of pollutants in urban areas with special reference to recognition of the presence of olefin-ozone reaction products	Ministry of Defence, Biological and Chemical Defence, St. Christopher House, Southwark Street, London, S.E.1.	G. D. Heath (Director)
Part 3. **Effects on Health** Medical research to indict as far as possible specific pollutants responsible for ill effects on health and to suggest maximum levels of tolerance			
3.1 Specific polluntants	(a) Carcinogens: polycyclic hydrocarbons, sources, stability, health hazards, etc.	M.R.C., Air Pollution Unit	—
	(b) Smoke extracts and tobacco tar: carcinogenicity. Response to inhaled smoke from different types of tobacco, inhaled gas (chlorine, SO_2) and to combinations of such exposures	London University: Institute of Cancer Research, Chester Beatty Institute, Fulham Road, London, S.W.3.	The Director, Chester Beatty Institute
	(c) Acid particles: including study of length of life of SO_3 vapour in air before conversion to acid	M.R.C., Air pollution Unit	—
	(d) Carbon monoxide: effect on performance and vigilance; measurement of carboxyhaemoglobin	do.	—
	(e) Asbestos: (i) study of structure and behaviour in biological systems using induced radioactivity; analysis of reference samples using neutron activation;	A.E.R.E.	—
	(ii) identification; chemical and physical properties in relation to carcinogenicity; contaminating substances and biological significance;	M.R.C., Air Pollution Unit	—

Problem	*Investigation*	*Organisation*	*Officer Responsible*
	(iii) asbestos and mesothelioma in Scotland;	M.R.C. and Dundee University, Dept. of Social and Occupational Medicine, Dundee, Scotland	Professor A. Mair
	(iv) physiological effects	M.R.C., Pneumoconiosis Research Unit	—
	(f) Irritants: effect on bronchial mucosa	M.R.C., Air Pollution Unit	—
3.2 Occupational health (a) (see also 1.8(b))	(a) Industrial dust disease: role of air pollution in relation to regional differences in prevalence of	do.	—
	(b) Steelworkers: chronic respiratory disease and particulate and chemical pollution levels at home and work	University of Wales, Welsh National School of Medicine, Dept. of Social and Occupational Medicine, The Parade, Cardiff, Wales	Professor C. R. Lowe
	(c) Physiological effects of industrial dusts, coal, hard metal dusts, beryllium	M.R.C., Pneumoconiosis Research Unit	—
	(d) Pneumoconiosis and other pulmonary diseases in coal mining:	N.C.B., Institute of Occupational Medicine	—
	(i) Study of relationship between respirable dust in the mining environment and the development of pneumoconiosis, in order to establish standards of dust control		—
	(ii)	N.C.B., Pneumoconiosis Field Research	—
	(e) Bronchitis: study of attack rate in relation to differing quality and composition of respirable dust in the mining environment	N.C.B., Institute of Occupational Medicine	—
	(f) Metabolism of chlorinated hydrocarbons using chlorine-38 labelled materials	A.E.R.E.	—
3.3 Studies of lung function, etc.	(a) In healthy and bronchitic subjects; effects of pollutants; lung as pneumatic system	M.R.C. Air Pollution Unit	—
	(b) Lung florae: effect of pollutants on	do.	—
	(c) Bronchitis: effect of smoking on	M.R.C., Pneumoconiosis Research Unit	—

Problem		Investigation	Organisation	Officer Responsible
	(d)	Effect of particle size and flow rate on deposition of particulate material in the human nose; clearance of deposited particles from usual passages	A.E.R.E.	—
	(e)	Dust deposit in lungs in health and chronic respiratory disease	N.C.B. Pneumoconiosis Field Research	—
3.4 Epidemiology	(a)	Trends in pollution and health in London	M.R.C., Air pollution Unit	—
	(b)	Air pollution and rates of consultation for respiratory disease, in relation to age, sex and smoking	Royal College of General Practitioners, Air Pollution Study Group, 14 Princes Gate, London, S.W.7.	— Dr. Stewart Crane
	(c)	Chronic respiratory diseases in relation to pollution and smoking in the U.K.; international studies in Britain, U.S. and Norway with particular reference to migrants from Britain; upper and lower respiratory tract disorders in town and country children	London University: London School of Hygiene and Tropical Medicine, Dept. of Medical Statistics and Epidemiology, Keppel Street, London, W.C.1.	Professor D. D. Reid
	(d)	Respiratory disease and function in young families in Harrow, and in schoolchildren in Kent	London University: St. Thomas's Hospital Medical School, Dept. of Clinical Epidiomiology and Social Medicine, London, S.E.1.	Professor W. W. Holland J. R. T. Colley
	(e)	Respiratory study of Sheffield schoolchildren in relation to air pollution	Sheffield University, Dept. of Preventive Medicine and Public Health, Western Bank, Sheffield, 10, Yorks.	Dr. J. G. Lunn
	(f)	Lung cancer mortality in relation to urban factors	M.R.C. Air Pollution Unit	—
	(g)	Studies of effects of air pollution	Dept. of Health and Social Security, Room A413, Alexander Fleming House, Elephant and Castle, London, S.E.1.	Dr. A. E. Martin
3.5 Public Health	(a)	Public Health administration, with special reference to prevention of air pollution and effect of housing on health	Liverpool University, Dept. of Public Health, Liverpool, Lancs.	Professor A. B. Semple

Problem		*Investigation*	*Organisation*	*Officer Responsible*
Part 4. Effects on Animal Life, Vegetation and Materials				
4.1 Animal Life	(a)	Fluorosis in farm animals	Ministry of Agriculture, Fisheries and Food, Central Veterinary Laboratory, New Haw, Weybridge, Surrey	The Director
4.2 Vegetation (see also 2.7(c) and 2.7(d))	(a)	Lichens and bryophytes: (i) construction of computer maps of pollution using pollution-sensitive species;	London University: King's College, Dept. of Geography, Strand, London, W.C.2.	Dr. F. Rose, Dr. P. D. Coker
		(ii) use as indicators of urban and industrial pollution;	University of Newcastle upon Tyne, Dept. of Botany, Newcastle upon Tyne, 1, Northumberland	O. L. Gilbert
	(b)	Uptake of SO_2 by vegetation	A.E.R.E.	—
	(c)	Response of stomata to air pollution	N.E.R.C., and University of Lancaster, Biology Dept., Lancaster, Lancs.	Dr. T. A. Mansfield
	(d)	Effect of air pollution on soils and vegetation	University of Strathclyde, Dept. of Geography, Glasgow, C.1.	R. Moss
	(e)	Growth of trees in Pennines in relation to air pollution	Forestry Commission, Research Division, Alice Holt Lodge, Wrecclesham, Farnham, Surrey	Dr. D. H. Phillips
	(f)	Effect of nearby major source of pollution on deciduous woodland	University of Wales: Cardiff Institute of Science Technology Cathays Park, Cardiff, Wales	Professor R. W. Edwards
	(g)	Husbandry practices to alleviate effects of air pollution; field studies	Ministry of Agriculture, Fisheries and Food, National Agricultural Advisory Services, Great House Experimental Farm, c/o Great Westminster House, Horseferry Road, London, S.W.1.	The Director, Great House Experimental Farm

Problem	*Investigation*	*Organisation*	*Officer Responsible*
	(h) Effect of air pollution on plant growth in glasshouses	Ministry of Agriculture, Fisheries and Food, National Agricultural Advisory Services, Lee Valley Experimental Horticulture Station, Ware Road, Hoddesdon, Herts.	The Director
4.3 Materials	(a) Uptake of SO_2 by building materials (see also 2.5(h)(i))	A.E.R.E.	—
	(b) Effect of air pollution as a factor in the durability of building materials (stone, concrete, surface coatings, plastics, metals, fired clay products)	Ministry of Public Buildings and Works, Building Research Station, Garston, Watford, Herts.	The Director
	(c) Effect of air pollution on high voltage (25 kV) insulators	British Railways Board, Electrical Research Division, Blandford House, Melbury Terrace, London, N.W.1	The Director
	(d) Effect of climate and air pollution on corrosion of steel	British Iron and Steel Research Association/Inter-Group Laboratories of British Steel Corp, P.O. Box 403, 33 Grosvenor Place, London, S.W.1	G. E. Speight
	(e) Effect of weather and air pollution on life of paint films; effect of light on paint degradation	1. Research Association of British Paint, Colour and Varnish Manufacturers, Paint Research Station, Waldegrave Road, Teddington Middlesex	The Director
		2. C.E.G.B.	
	(f) Effect of air pollution, weather, light on degradation of titanium dioxide pigments in various media	British Titan Products Co. Ltd., Carlton Weathering Test Station, Yarm Back Lane, Hartburn, Stockton-on-Tees, Co. Durham	The Superintendent

Problem	*Investigation*	*Organisation*	*Officer Responsible*
	(g) Vertical distribution of air pollution at the Post Office Towers in London and Birmingham (in connexion with effect on PO equipment)	Post Office Purchasing and Supply Dept., Materials Section, (i) Studd Street, London, N.1. (ii) Fordrough Lane, Birmingham, 9, Warwicks. (In collaboration with W.S.L.)	Dr. J. C. Harrison, (London) R. J. Feasey (Birmingham)
Part 5: Measurement Methods (See also specific programmes in Parts 1 to 4)	(a) Studies on chemical and physical nature of pollutants; reactions between pollutants; methods for their determination; improvement of comparability of methods in different places; use of electron microscopy and diffraction techniques for identification of particulates	M.R.C., Air Pollution Unit	—
	(b) (i) Improvement of existing methods of measuring the concentration and history of pollutants in each other's presence;	Ministry of Defence, Biological and Chemical Defence, St. Christopher House, Southwark Street, London, S.E.1	G. D. Heath (Director)
	(ii) method for using micro-organisms to recognise the degree of activity of biodicidal pollutants not detectable by chemical means	do.	
	(c) SO_2 recorders; directional samplers; automatic data logging and telemetering: international standardisation of methods	W.S.L.	
	(d) Development of simple, rapid methods for determination of toxic substances in industrial atmospheres	Laboratory of the Government Chemist, Cornwall House, Stamford Street, London, S.E.1	Dr. D. T. Lewis (Government Chemist)
	(e) Correlation between methods of SO_2 determination	University of Salford, Dept of Civil Engineering, Salford, 5, Lancs.	G. Rhodes F. L. Thomas

Problem	*Investigation*	*Organisation*	*Officer Responsible*
	(f) Electron microscopy and diffraction techniques for identification of air pollution particles; flow behaviour of airborne particles	University of Wales: University College of South Wales and Monmouthshire, Dept of Mineral Exploitation, Cardiff, Wales	Professor J. Platt
	(g) Examination of smoke filter papers using spectrographic and atomic absorption methods; isolation of hydrocarbons using gas and thin layer chromatography	Blackburn College of Technology and Design, Dept of of Pure and Applied Science, Blackburn, Lancs.	S. Hargreaves
	(h) Dust analysis	M.R.C., Pneumoconiosis Research Unit	—
	(j) Dust sampling and analysis; mainly in relation to to dust produced by working in coal and rock in mines and the pneumoconiosis problems; development of sampling and recording instruments; use of electron microscopy, X-ray diffraction and infra-red spectrophorectic methods in dust analysis	Safety in Mines Research Establishment, Central Laboratories, Red Hill, Broad Lane, Sheffield 3, Yorks.	The Director
	(k) (i) Development of lazer-operated aerosol spectrometer;	A.E.R.E.	—
	(ii) automatic continuous measurement of visibility by light scattering; automatic hourly filter tape equipment for collection of particulate matter, SO_2, ammonia and other pollutants;	do.	
	(iii) data-logging equipment for measurement of meteorological parameters in association with the previous equipment; electron microscopy and diffraction for examination of atmospheric aerosols	do.	

Problem	*Investigation*	*Organisation*	*Officer Responsible*
	(l) (i) Sulphurous odour pollutants; human perception, and rapid measurement of concentration in air;	London University, Imperial College of Science and Technology, Dept. of Chemical Engineering and Chemical Technology, Prince Consort Road, London, S.W.7	Dr. M. J. G. Wilson
	(ii) study of acid particles using metal film technique	do.	
	(m) Simple, rapid sampling and analysis of aero gas turbine combustion products, using current gas/solid chromatographic techniques	National Gas Turbine Establishment, Pyestock, Farnborough, Hants.	D. I. Dawton

The Warren Spring Laboratory of the Ministry of Technology

Warren Spring Laboratory carries out research on the nature and extent of air pollution, and on its prevention and abatement, in order to provide technical information necessary for the administration of clean air legislation, for town planning and the location of industry, and for research into the effects of air pollution.

The National Survey of Air Pollution

Ten years ago the existing scheme of daily observations of smoke and sulphur dioxide, made by Local Authorities and others in co-operation with the Warren Spring Laboratory, was extended in such a way as to form a National Survey from which valid conclusions could be drawn on the incidence of air pollution in urban areas throughout the United Kingdom. There are now, 31 March, 1970, 485 Authorities making these observations at 1,197 sites, and of these sites, 164 are in the country to give background information, for comparison.

In addition, monthly measurements of grit-and dust-fall are made with the British Standard Deposit Gauge by 192 Authorities at 675 sites. Monthly measurements are also made of the rate of reaction of sulphur compounds in the atmosphere with a standard lead dioxide surface, by 99 Authorities at 389 sites.

The Laboratory gives help and advice on all aspects of this co-operative investigation. In particular, newcomers to the scheme are advised on the selection of suitable sites for their instruments.

All data submitted to the Laboratory are collated and published as Annual Tables. For smoke and sulphur dioxide, these Tables give, for each site and for each month in the year, the average concentration, the highly daily concentration and the number of days when the concentration exceeded certain limits. The seasonal and annual average figures are also given. For grit-and dust-fall, and for the lead dioxide observations, the data for each month and the seasonal and annual averages are given.

Abstracts of papers and other information on air pollution are also published monthly.

These Annual Tables and Abstracts are available on request to all concerned with problems of air pollutions.

In addition, a series of Reports on the Investigation of Atmospheric Pollution published by H.M. Stationery Office, gave analyses of these results and an account of research on the measurement and abatement of air pollution.

The last in this series, the 32nd Report, brought the position up to date to 1966, and gave, in addition, an account of the changes in the administrative arrangements.

A series of Reports on the state of air pollution in the United Kingdom, as shown by the National Survey, is now in course of preparation. Drafts for the standard statistical regions are now under discussion with the Standing Conference (see below) and the first two, on the South-East Region, and on London, should be ready for publication this year. A definitive paper on trends in pollution over the last 10 to 20 years has been prepared using the whole of the National Survey data. Part of this is now in the press, and the remainder will be available shortly. This will ultimately form part of a General Introduction to the Survey Reports.

Standing Conference of Co-operating Bodies

All local authorities and other organizations who make measurements of air pollution, either as part of the National Survey or purely for their own local purposes, and who submit the data regularly to Warren Spring Laboratory for publication, are entitled to send representatives to the Standing Conference of Co-operating Bodies. Other bodies may do so on payment of a subscription. This Conference meets twice yearly to discuss matters of interest connected with air pollution. At 31 March, 1970, 438 bodies had appointed representatives to the Conference.

Automatic Instruments

A system has been devised whereby a sulphur dioxide recorder in the Warren Spring London Laboratory at Islington is plugged into the Post Office telephone and, on dialling the Islington number from the Stevenage laboratory, the reading of the recorder appears on a dial at Stevenage. If pollution is abnormally high at Islington the recorder there automatically dials the Stevenage laboratory, where it rings an alarm bell. Effort is now concentrated on the automation of recording stations so that the data from continuous or other recorders can be fed directly into a computer.

Town Planning Studies

In the past few years it has become increasingly apparent that while it is quite impracticable to control the amounts of sulphur oxides in the air by limiting their emission (as is done for smoke under the Clean Air Act), it is, nevertheless, possible to make great improvements by taking full advantage of natural dispersion processes. This can be done by the proper design of chimneys in relation to buildings and the proper siting of the various types of residential district in relation to each other and to industrial installations. A great deal of effort is being devoted to obtaining sufficient knowledge of the distribution and spread of pollution in urban areas to enable town planners to do their work satisfactorily from an air pollution point of view.

While the National Survey provides information on the distribution of pollution in urban areas this is being supplemented by special investigations. For example, a survey is being undertaken as part of the programme of the Warren Spring Laboratory by the Department of Geography of the University of Edinburgh to examine the build-up and dispersion of pollution over the city. The effects of topography, weather conditions, and the relation of industry to housing are being examined.

The general problem of the ventilation of cities is being studied in London by observations at various heights on the Post Office Tower. Laser equipment has been purchased and is now coming into operation to study the dispersion of particulate matter over cities.

A great deal of advice on the siting and heights of chimneys is given both to local authorities and to industry. This often requires tests of a model in a wind-tunnel, particularly when dealing with a complicated building complex or with difficult topography. A suitable tunnel has now been built at Stevenage so that this type of test can be undertaken. The tunnel will also be used to obtain more basic information on dispersion from chimneys.

Abatement of Nuisance from Malodorous Emissions

Now that such good progress has been made towards the removal of smoke from towns, various other pollutants that previously tended to be overlooked in the generally smoky air, are becoming more and more apparent and are causing lively complaint. These are the malodorous emissions from various types of industry, from the offensive trades and, most widespread of all, from motor vehicle exhausts. Warren Spring Laboratory is examining these problems to see where there may be possibilities of solutions.

The Central Electricity Generating Board

The main sources of air pollution from the operations of the Generating Board are the products of combustion of coal and oil. These are considered under the headings of: separation of solids from gases; dust measurement; disposal of solids; dispersion of gases.

Separation of Solids from Gases

Both the older and more modern pulverised fuel plants rely on electrostatic precipitation as the final or only stage of separation of particulate matter from flue gases. A research programme has revealed unexpected deficiencies in gas distribution, in rapping and in power supplies in some older plants. As soon as this research can be applied to individual plants, the deficiencies are being made good. Poor gas distribution leads to reduced efficiency because the greater efficiency of dust removal in a starved channel does not fully compensate for the reduced efficiency in an overloaded one; when, by means of velocity measurements and model techniques, the gas flow has been analysed, baffles can be designed and inserted to smooth the flow. Rapping impulses by means of which the collected dust is removed from the precipitator electrodes, have been found by actual measurement with accelerometers to be much attenuated if transferred from one member, such as a holding frame, to another, such as the plate or wire itself. Research on optimum electrical subdivision of the precipitator has shown the need for maintaining maximum power supply to each section and the importance of correct electrode spacing to reduce flashover.

Statistical analysis of the results of efficiency tests has shown the relative contribution to efficiency of such factors as size of precipitator, degree of sub-division, specific collecting area, power input, and the characteristics of the ash and the coal. It is clear that too low a sulphur content impairs collecting efficiency by making the particles electrically non-conducting, but no simple practical means of increasing the effective sulphur content of the ash from low-sulphur coals has been developed for routine application. Since sulphur dioxide emitted from large power stations with tall stacks has been shown to make only a very small contribution to ground level concentrations, there is a case for reserving low-sulphur coal for use in small appliances in non-pulverised form.

Dust Measurement

An important part of a dust-arresting installation is some means of informing the operator of any failure to function correctly. The pollution by dust at ground level is caused in the main by particles in the range from 20μm upwards, and an instrument has therefore been developed known as the CERL Dust Monitor which gives a continuous record of the emission of these coarser particles which are not recorded by instruments used to measure the emission of smoke. The CERL Dust Monitor has recently been redesigned to give it the maximum reliability under power station conditions and the Mark II instrument is now commercially available from two firms and is being tried out in other industries including cement and iron works. The nuisance from excessive emissions is a function of total output over a period of time, and integrators for the sum of the readings of all instruments in a power station over an eight-hour shift period are under development.

With sufficient sensitivity, combined with accuracy in regard to the zero reading for clean gas, a smoke meter can give a useful indication of the dust content of flue gases. Such optical instruments are mainly influenced by the finest particles, but if the dust grading does not vary greatly at the outlet of a precipitator the readings of such instruments may correlate sufficiently well with dust-arresting performance to serve the purpose of an operational guide. An instrument which can be inserted from one side of a duct and removed for a manual check of the zero has been developed and is commercially available. An instrument which has no parts within the flue but measures light reflected from dust particles has been developed and is under trial. And a modification of the type of instrument which shines a light beam right across a duct is under development; this will give a frequent and automatic recording of the instrument zero.

Because it was thought that the standard deposit gauge had a limited application to modern dust problems, a new type of gauge has been developed for measuring dust in the field known as CERL Directional Dust Gauge. This has been used in routine measurements around a number of modern power stations and its directional characteristics are considered to be of considerable assistance in the interpretation of measured results. Its design is being modified to make it as cheap as possible to produce and is being incorporated in a British Standard Specification which will be published shortly.

Ash Disposal

Local air pollution can arise where dust which is handled or dumped is allowed to dry. Economical techniques of surface treatment are under investigation. There is a particular problem with cenospheres (floaters) on ash lagoons. These can dry on the surface layer and be picked up by the wind. A number of methods for dealing with this difficulty are now being investigated, from immobilising them *in situ* to harvesting them for industrial use.

Dispersion of Gases

Eight-day SO_2 samplers are used routinely around power station sites for a number of years before and after commissioning of the stations. In addition a number of stations have been intensively instrumented using in each case about two dozen continuously recording SO_2 instruments and full meteorological instrumentation. The SO_2 recorders were developed about 10 years ago at CERL and have been successfully used in these surveys. The surveys have given excellent support to theoretical predictions and to the effectiveness of tall chimneys in controlling large-scale emissions of flue gas, as well as providing new knowledge on the particular influence of inversion layers above and below the chimney top. One important aspect of chimney height is now seen to lie in the proportion of inversions which are penetrated by the flue gases.

The Tilbury and West Burton investigations have been concluded. A furthur survey of this type is under way at Eggborough which is the first 2000MW power station employing a single chimney. This survey has 25 SO_2 recorders and meteorological meaurements which for the first time give details of atmospheric conditions up to 1,250 feet from the surface of the Earth. The use of a laser to measure the height of a plume, even though it is invisible to the eye, has been developed for some years at the Tilbury survey. This will continue to be used at Eggborough and its use will also be developed to study the temperature profile of the atmosphere in the range immediately above 1,250 feet.

Other Potential Problems

Increase of ground level relative humidity downwind of cooling towers has been looked for, with negative results. On the relatively few occasions when the atmospheric relative humidity approaches 100 per cent a long plume is formed, and it has been reluctantly concluded that nothing can be done about the vagaries of nature.

The Atomic Energy Research Establishment

Objectives

The Harwell programme is concerned with the physical and chemical characteristics of pollutants, with pollutant life-cycles and reactions in the atmosphere and with the development of instruments. Particular attention is being paid to the problem of industrial mists but the programme also includes an investigation into the uptake of SO_2 by building materials and by vegetation.

Tees-side Survey

The object is to find out if there is more fog and mist on Tees-side than can be ascribed to geographical and meteorological factors alone and, if so, whether the cause is associated with any particular atmospheric pollutant.

The investigation in 1967 was based on the chemical analysis of samples of aerosols collected over 24-hour periods at five sites on Tees-side. The dominant pollutant among those considered as possible stabilisers of mist droplets was ammonium sulphate the concentration of which was shown to correlate rather well with the reciprocal of visual range as obtained from Tees-side airport. In the summer of 1968, sampling was extended to five other sites in England. Ammonium sulphate was found in fair quantities on all sites, the average concentration at Stockton-on-Tees being some 60 per cent higher than the lowest recorded (at Leconfield). Gaseous ammonia levels at Stockton were, however, relatively much higher. The data suggest that the conversion of ammonia to ammonium sulphate is a comparatively slow process but that, under certain conditions not yet understood, the conversion rate is sufficiently rapid for significant amounts to be formed in periods of one hour or less.

Development of Air Sampling Equipment

The scope of these first surveys was limited by the lack of suitable equipment. It became clear that in order to study effectively the dynamics of pollution situation, such as that on Tees-side, short-term sampling with local meteorological data collection was essential. It was decided therefore to develop suitable instruments and to incorporate them into an automatic sampling station capable of operating unattended for periods of up to one month. The following items of equipment have been developed.

(i) An automatic high flow-rate sampler for collecting hourly samples of aerosols on paper tape. Recently, an atmospheric stability indicator, based on measurement of the natural radon decay products, has been added.

(ii) An integrating nephelometer for measuring visibility by a light scattering technique.

(iii) A data logging system based on the Harwell 7000 series.

(iv) Impregnated paper tape samplers, specific for sulphur dioxide and ammonia.

Two of the automatic stations have operated successfully on Tees-side in the latter half of 1969 and two more are nearly ready. First results have been encouraging. When the samples from Stockton are grouped in narrow ranges of relative humidity, excellent correlation is found between the concentration of ammonium ion and the reciprocal of visual range determined by the nephelometer.

Physical Measurements on Fog and Haze Particles

A prototype automatic sampler has been developed for the special conditions of sampling required for electron microscopy of pollutant particles. By observation of shape, behaviour in the electron beam and by electron diffraction, it is possible to identify individual particles such as ammonium sulphate and to determine size distributions. Theoretical calculations of the light scattering expected at different relative humidities confirm that most of the Tees-side haze is due to ammonium sulphate.

Improved techniques for measuring the size distribution of water droplets in fog have revealed a much higher proportion of droplets of diameter less than two microns than has hitherto been observed. As a result, it is now possible to account for nearly all the light scattering coefficient of fog.

Life Cycle of SO_2 in the Atmosphere

Chemical and Photochemical Reactions

Conversion to ammonium sulphate is one of the processes by which sulphur dioxide is removed from the atmosphere. This mechanism and other reactions of sulphur dioxide are being studied in controlled atmospheres in the presence of water droplets, ammonia gas and various catalysts. Photochemical reactions are also being investigated.

Absorption of Sulphur Dioxide on Surfaces

Direct uptake on surfaces is believed to play an important part in the removal of sulphur dioxide from the atmosphere, and it may also be a factor in some corrosion problems. When studying processes of this type it is extremely important to use realistic concentrations of the pollutant to avoid the risk of swamping that effect which is the important one in practice. The use of labelled sulphur dioxide, $^{35}SO_2$, enables this criterion to be met. Experiments have been carried out on the uptake and metabolism of SO_2 on barley plants, on the surfaces and furnishings of rooms, on limestones and on various wallpapers and leathers. From the laboratory data, an estimate has been made of the rate of dry deposition on vegetation demonstrating that this is an efficient removal process. The observation that the uptake on limestone is particularly high when the surface is damp correlates with observed damage to limestone frescoes. The work on wallpapers and leathers has been carried out with the corresponding Manufacturers' Associations and has shown very clearly the importance of surface finishes and tanning procedures.

Absorption of Sulphur Dioxide on Particles

Although air pollution is known to have respiratory effects on man, pure sulphur dioxide appears to have little. One theory is that SO_2 can only penetrate to the alveoli when attached to particles. Experiments in an aerosol chamber shown that at equilibrium the proportion of gas-phase SO_2 adsorbed varies from 1.3 per cent on tobacco smoke to 0.04 per cent on the natural aerosol taken on a relatively unpolluted day.

The Medical Research Council's Air Pollution Research Unit

The following notes describe briefly the current work on air pollution being done by the M.R.C. at St. Bartholomew's Hospital Medical College. For convenience the work is described in outline under various headings but it will be realised that the method of presentation does not mean that the topics are being investigated in isolation. The various investigations are highly integrated and it should be stressed that there is excellent liaison between the M.R.C. Air Pollution Unit, other M.R.C. units and outside bodies. The unit has been designated as the World Health Organisation International Reference Laboratory on Air Pollution.

Chemistry and Physics

As a prerequisite to the proper study of the effects of pollution much work is still being done on the chemical and physical nature of pollutants and methods for their determination.

Optical Assessment of Particulate Pollution

Optical methods are widely used to assess airborne particulate matter. In particular, smoke is commonly measured by the soiling of filters, but the techniques used are not the same everywhere and the measurements are interpreted on a purely empirical basis. It is therefore often difficult to compare results from different parts of the world, and even in this country to compare samples taken at the same place at different times, because the blackness of the particulate matter in the air is changing all the time as the Clean Air Act takes effect. The optics of the assessment of soiling, and the effect of the geometrical distribution of smoke particles collected on filters on the results obtained, have been studied, with a view to gaining a better understanding of the phenomena affecting the measurements. This understanding is a necessary preliminary to comparison of results obtained by different workers and to the development of methods better suited to present needs. Further work on the optics of particles deposited on glass slides is under way.

Studies on Carcinogens

Our interest in 3:4-benzpyrene and other polycyclic hydrocarbons is declining since not only are their concentrations in air now decreasing but the evidence that they are associated with lung cancer is much weaker than it was some years ago. Some studies on the stability of these hydrocarbons have shown that some of them appear to be destroyed by ultra-violet light and nitrogen dioxide. Investigation into the sources of polycyclics has shown that the relative proportion of certain hydrocarbons can vary; using a ratio of coronene to 1:2-benzpyrene (two stable hydrocarbons) it has been possible by analysing samples of collected smoke to identify sources of hydrocarbons such as coal fires and motor vehicles. A study into the production of hydrocarbons from burning fuels has shown that the above hydrocarbon ratio increases markedly as the combustion efficiency increases.

Asbestos

Asbestos can no longer be considered to be merely a pollutant of industrial atmospheres; recent work on the prevalence of mesotheliomas has shown the need to study it as an urban pollutant. Samples of asbestos which have been shown to be highly carcinogenic to rats have been examined for organic material. A number of constituents have been identified including trace amounts of 3:4-benzpyrene, and paraffinic hydrocarbons, a high proportion of which latter compounds come from the polythene bags with which the asbestos has been in contact, and a quinoid oxidation product of an anti-oxidant present in the polythene. The biological significance of contaminating substances associated with the asbestos has yet to be assessed.

Some preliminary studies on bulk samples of smoke collected in the City have been carried out in which the samples are extracted with organic solvents and ashed at low temperatures so that they can be examined with an electron microscope for asbestos fibres. A few asbestos-like fibres have been detected; examination using electron diffraction techniques is planned to help with the identification of such fibres.

Acid Particles

Acid particles, which may be of clinical significance, are very common in town air. Their source at times of low pollution appears to be the efficient combustion of fuels; past records show that at times of high pollution synthesis of acid takes place and that high concentrations of sulphur dioxide and smoke occurring together are important for the formation of much particulate acid.

Since sulphur trioxide vapour and sulphuric acid when inhaled are likely to have different physiological effects, some laboratory experiments are being carried out to determine how long the vapour can exist as such in air before it is converted to sulphuric acid.

Carbon Monoxide

Because of the many sources of carbon monoxide, its varying concentrations in air, and the fact that its absorption depends on exercise and time, the measurement of carboxyhaemoglobin is greatly to be preferred to measurement of CO in air. The simpler indirect methods of measuring carboxyhaemoglobin such as the measurement of alveolar air are being tested; this involves simply analysing carbon monoxide in exhaled air after breath-holding.

Electron Microscopy

Work is continuing on the depiction and identification of particulate pollutants by electron microscopy and electron diffraction, special attention being paid to asbestos. We have devised a method for treating samples of beer so that their residues can be examined for asbestos fibres using the electron microscope. This preparative technique could also be used for the study of asbestos fibres in samples of solid air pollutants.

Development of Instruments and Apparatus

An oscillating glass slide for use with the cascade impactor and thermal precipitator is under development. It is designed to obtain larger dust sample traces for the work on the optics of particles deposited in glass slides.

Equipment is to be made for the generation of monodisperse aerosols which will include an automatic dual syringe drive.

Apparatus for the study of surface active materials is being developed.

The improvement and automation of lung function measurements is being studied with special reference to ways in which a digital computer may be used to accept and process signals from the whole body plethysmograph and other apparatus.

Physics of the Lung and Measurement of its Function

The fundamental study of the lung as a physical system is enabling us to reassess the methods of measuring its function in health and disease. In the past, studies to determine the physiological effects of environmental pollutants have been hampered by the lack of a very sensitive test to assess the effects of respiratory insult, and as part of the search for a more refined technique, we are developing new methods of assessing respiratory function. The analysis of continuous respiratory waveforms is being studied using the unit's own on-line digital computer to process the physiological data.

Studies of Acute Effects of Inhalation of Pollutants

Very many combinations of gases and aerosols of different composition have been inhaled in order to study their effects on airway resistance and gas diffusion. As yet no consistent responses have been seen to follow exposures to realistic concentrations in the laboratory.

Daily measurement of airway resistance following exercise has shown some correlation with pollution and this is being studied carefully.

Daily measurements of simple indices of pulmonary ventilation have been made for a five-year period on healthy volunteers but no consistent relation with pollution has been found. Measurements of peak expiratory flow rate on selected bronchitic patients continue and there is an indication that sensitivity to high peaks of pollution decreases as the winter goes on.

We are making long term cohort studies of lung function and respiratory symptoms on medical students to see if early signs of the development of chronic bronchitis is related to pollution, smoking habits, changes in residence, age and athleticism.

Carbon Monoxide

Following the development of the micro-method for determining CO in blood (mentioned above) surveys of blood levels have been made in people exposed occupationally or experimentally to traffic. These have shown, so far, that levels above four per cent saturation with carboxyhaemoglobin are rarely attained in non smokers but levels higher than this (not uncommonly greater than 10 per cent) are frequent in smokers. These surveys are being extended.

Experimental work is being done on the possible effects of carbon monoxide, producing a saturation of up to 10 per cent, on the performance of fine tasks and on vigilance. So far the results have shown no perceptible effects of such saturations on flicker and flutter fusion thresholds. Work on more complex tests is being done.

Physiology, Bacteriology and Histology

Effect of Irritant Atmospheres in the Chemical Industry on Bronchial Mucosa

We have arranged that samples of lung and bronchi from post mortem and biopsy material be sent to us for histological examination to assess the degree of mucosal hypertrophy. The material comes from I.C.I. employees and is examined "blind" in that their occupational exposure to irritants is not known. The work is designed to test the hypothesis that chronic bronchitis is not mainly caused by exposure to such simple chemical irritants as SO_2.

Bacteriology. Effects of Pollutants on Lung Flora

It has been suggested that pollution in town air is responsible for the greater prevalence of chronic bronchitis in towns compared with country districts. As part of our investigations into the possible relationship between air pollution and bronchitis we have been studying the effects (in vitro) of particulate pollutants collected from London air on the growth of some organisms found in the respiratory tract—Strep. viridans and Staph. aureus—and those commonly recovered from the sputum of patients with chronic bronchitis—Strep. pneumoniac and H. influenzae. Our experiments have shown that solid pollutants can not only inhibit bacterial growth on blood agar plates but they can also cause growth stimulation of H. influenzae. A chemical separation of pollutants has shown that the growth inhibitor is mainly in the water soluble fraction and the stimulator is in the organic soluble fraction. Studies so far suggest that the factors present in pollutants are not capable of replacing "X" or "V" as growth requirements but probably act indirectly through an effect on the medium.

Epidemiology

Our efforts to determine whether the marked improvement in pollution conditions in London during recent years have led to any corresponding improvements in health are continuing. There is now little evidence of any association between daily death rates, hospital admissions and pollution. This is due largely to the absence of periods of high pollution in recent years; we would not expect smoke to reach high values any more but there is good reason to believe that high concentrations of sulphur dioxide would still occur in temperature inversions. It may be however that the absence of a blanket of smoke and the increased turbulence introduced by tall buildings has reduced the risk of temperature inversions persisting through the daytime hours. Our latest "diary" study, in which patients who had responded consistently to changes in pollution in an earlier winter were again asked to record changes in their condition on a daily basis, has also failed to demonstrate any marked effects of pollution.

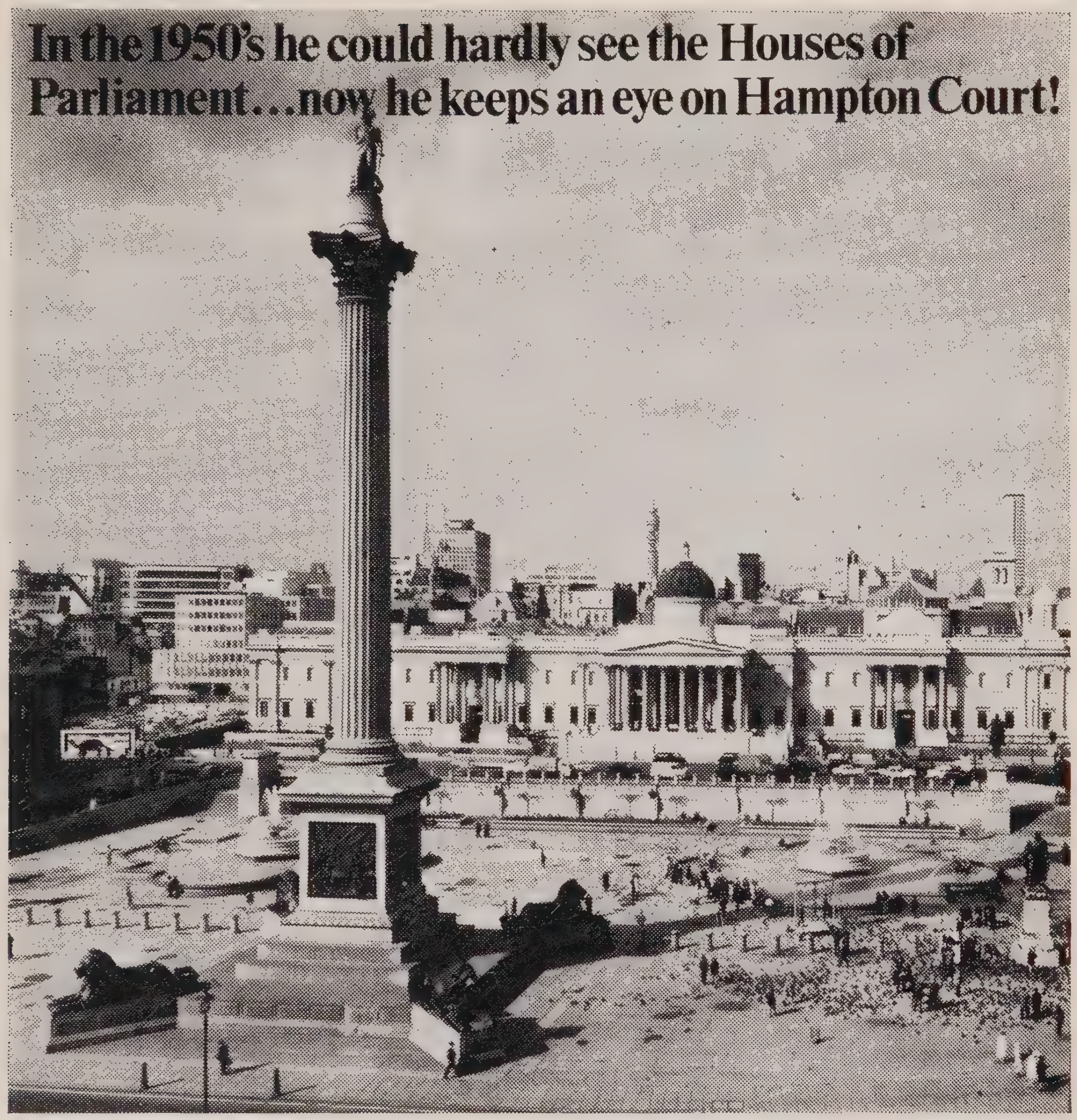
These results are encouraging, but we could not claim yet that the acute effects of pollution in London have been eliminated. We may merely have been lucky with the weather in recent winters, and the examination of daily death rates and hospital admission data will continue.

Studies on chronic effects also show encouraging signs; bronchitis mortality is beginning to decline again, particularly in London, and although the improvement may be due partly to changes in smoking habits and to improved therapy the situation is being watched carefully in relation to changes in pollution.

Studies of the epidemiology of lung cancer continues and, as evidence accumulates and is analysed, it is becoming increasingly apparent that cigarette smoking is of overwhelming importance as the main cause of the disease and the role of air pollution would appear to be minimal.

An earlier study had shown that chest illness was commoner in children who had lived in polluted environments, and further work is now in progress to determine whether exposure to urban air pollution in infancy has any detectable effect on lung function in later life.

Extensive use is made of large-scale computing facilities for all this work, and files of data are maintained on magnetic tape.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The Law Relating to Air Pollution

The principal legislation in Great Britain (excluding Northern Ireland) is contained in the Clean Air Acts 1956 and 1968, but some of the "nuisance" provisions of the Public Health Act 1936 extended by the Public Health Act 1961 and amended by the Public Health (Recurring Nuisances) Act 1969 are applicable in specified circumstances. The domestic smoke control area provisions of the Clean Air Act 1956 were amended by section 95 of the Housing Act 1964.

The provisions of the Clean Air (Northern Ireland) Act of 1964 are largely identical to those of the 1956 Act.

The control of "noxious or offensive gases" from some 59 different classes of works registrable under the provisions of the Alkali etc. Works Regulation Act 1906 and the Alkali etc. Works Order 1966 is exercised by the Alkali Inspectorate of the Ministry of Housing and Local Government (see the section on page 62) on the Akali etc. Works Regulation Act.

Action may also be taken under Common Law procedure by anyone who suffers nuisance from air pollution, and in this way it may be possible to secure damages and to obtain an injunction.

There are also a number of Private Acts of Parliament in which some local authorities possess powers to deal with smoke emission, to establish smokeless zones and to grant optional prior approval of proposed new industrial fuel burning installations. Most of these provisions, although they may remain in force, have now been superseded by the provisions of the Clean Air Acts 1956 and 1968. Pollution from road vehicles is exercised by the police under the provisions of the Road Traffic Acts and the Motor Vehicles (Construction and Use) Regulations 1969, a note of which is to be found on a later page.

The following outline of current legislation, which necessarily omits much detail, gives the main provisions of the Clean Air Acts 1956 and 1968 and supporting Acts under the main subjects of "smoke", "chimney heights", "grit, dust and fume" and "miscellaneous provisions".

1. The Control of Smoke

(*a*) Definition of "dark" and "black" smoke:

Where legal standards of emission are prescribed for smoke, they refer to "dark" and "black" smoke. These are defined in the 1956 Act, and in Regulations, by reference to a shade on the British Standard Ringelmann Chart (see page 63) as:

> "Dark" smoke (defined in S.34 of the 1956 Act) means smoke which if compared . . . with the Ringelmann Chart would appear to be as dark as or darker than shade 2 on the chart.
>
> "Black" smoke (defined in the Dark Smoke (Permitted Periods) Regulations 1958) means smoke which, if compared . . . with the Ringelmann Chart, would appear to be as dark as or darker than shade 4 on the chart.

(*b*) Use of Aids in Assessing Smoke Colour:

Although legislation defines dark and black smoke by reference to colour shades in the Ringelmann Chart, the use of the Chart is not compulsory. S.34(2) of the 1956 Act says that "For the avoidance of doubt, it is hereby declared that . . . the court may be satisfied that smoke is or is not dark smoke as hereinbefore defined notwithstanding that there has been no actual comparison thereof with a chart of the said type."

(*c*) **Design Standards for New Plant:**

Section 3 of the Clean Air Act 1956 requires all new furnaces (other than domestic boilers with a rating less than 55,000 Bhu/hr.) to be, so far as practicable, capable of operating continuously without emitting smoke when burning fuel of a type for which the furnace was designed.

There is no definition of "furnace", but a practical interpretation of this word wherever it appears in Clean Air legislation, is usually taken as "any enclosed or partly enclosed space in which liquid, solid or gaseous matter is burned, or in which heat is produced".

It is a requirement of this section that the proposed installation of all new furnaces (other than domestic boilers rated at less than 55,000 Btu/hr.) *must* be notified to the local authority, and if one wishes to do so, one may apply for local authority approval that the proposed unit is capable of substantially smokeless operation. The approval does not, however, allow indiscriminate smoke emission and the furnace must be operated to ensure that permissible emissions are not exceeded.

(*d*) **Standards for Smoke Emission:**

Section one of the Clean Air Act 1956 prohibits the emission of dark smoke from a chimney, but also allows the Minister of Housing and Local Government to make regulations exempting prescribed lengths of emission from possible action under this section.

The "permitted emissions" are prescribed in the Dark Smoke (Permitted Periods) Regulations, 1958: and the Dark Smoke (Permitted Periods) (Vessels) Regulations 1958.

(*d*)(*i*) **The Dark Smoke (Permitted Periods) Regulations 1958 (Statutory Instrument 1958 No. 498).**

(*a*) **Aggregate emissions of dark smoke.**

Number of furnaces served by the chimney	*Permitted emission of dark smoke in any period of eight hours*	
	If not soot blowing during period	*If soot blowing during period*
One	10 mins.	14 mins.
Two	18 mins.	25 mins.
Three	24 mins.	34 mins.
Four or more	29 mins.	41 mins.

Where a single boiler or unit of industrial plant is fired by more than one furnace discharging into the same chimney, those furnaces shall be deemed to be one furnace.

(*b*) **Continuous emissions of dark smoke**

The continuous emission of dark smoke in excess of four minutes, caused otherwise than by soot blowing, is prohibited.

(*c*) **Aggregate emission of black smoke**

No emission of black smoke exceeding two minutes aggregate in any period of thirty minutes is allowed.

There are thus three standards of

emission which are acceptable in relation to any one chimney. The penalty for an offence under section one of the Act is a fine not exceeding £100.

(*d*) **(ii) Smoke emission from vessels:**

By the provisions of section 20 of the 1956 Act, vessels in waters not navigable by sea-going ships and in waters within the seaward limits of the territorial waters of the United Kingdom must comply with the dark smoke provisions of Section one of the 1956 Act, subject to the permitted emissions contained in the Dark Smoke (Permitted Periods) (Vessels) Regulations 1958 as follows:

Dark Smoke (Permitted Periods) (Vessels) Regulations (Statutory Instrument 1958 No. 878)

These regulations specify the periods within which dark smoke is permitted from vessels in various classes of case, as detailed in the schedule below. The phrases in italics, "10 minutes in 2 hours," etc., mean that 10 minutes emission of dark smoke *in the aggregate* is permitted in any period of 2 hours.

Schedule—Classes of Case

1. Emissions from a forced draught oil fired furnace, or an oil engine. *10 minutes in 2 hours.*
2. Emissions from a natural draught oil fired boiler furnace (except in the cases falling within class 4 below). *10 minutes in 1 hour.*
3. Emissions from a coal-fired boiler furnace:
   (*a*) when the vessel is not under way (except in the cases falling within class 4 below). *10 minutes in 1 hour.*
   (*b*) when the vessel is under way. *20 minutes in 1 hour.*
4. Emissions from a natural draught oil-fired boiler furnace or a coal-fired boiler furnace in the following cases:
   (*a*) a vessel with funnels shortened for the purpose of navigating the Manchester Ship Canal;
   (*b*) a tug not under way, but preparing to get under way or supplying power to other vessels or to shore installations;
   (*c*) a vessel not under way but using main power for the purpose of dredging, lifting, pumping or performing some other special operation for which the vessel is designed. *20 minutes in 1 hour.*
5. Emissions from any other source. *5 minutes in 1 hour.*

In addition, *continuous* dark smoke caused otherwise than by the soot-blowing of a water-tube boiler, shall not exceed:

(1) in the case of classes 1 and 2 above. *4 minutes.*
(2) in the case of natural draught oil-fired boiler furnaces in class 4. *10 minutes.*

Further, in *no case* shall black smoke (Ringelmann 4) be emitted for more than *3 minutes* in the aggregate in any period of *30 minutes.*

(*d*) **(iii) Defences for excessive dark and black smoke emission**

Section one of the 1956 Act contains 3 defences which may be available if an occupier of premises is proceeded against for dark/black smoke emission. These briefly are that the emission was solely due to

(*a*) lighting a furnace from cold:
(*b*) unavoidable mechanical breakdown; and
(*c*) unavoidable use of unsuitable fuel.

These are not absolute defences and are available only if every practical effort is made to avoid the emission.

(*e*) **Emissions of Dark Smoke from "Bonfires" etc.**

On 1 October 1969 Section one of the Clean Air Act 1968 became operative. This section prohibits (subject to prescribed exemptions) the emission of dark smoke from industrial or trade premises (as distinctive from chimneys) and is concerned mainly with preventing excessive smoke emission caused by the indiscriminate burning of industrial or trade refuse in the open, but this section will also control dark smoke emissions from industrial processes not having a chimney.

In this connection, "industrial or trade premises" means premises normally used for industrial or trade purposes, or premises not normally so used, but which, at the time of the offence, were being used for industrial or trade burning.

The Minister has made the Clean Air (Emission of Dark Smoke) (Exemption) Regulations 1969, which exempt the admission of dark smoke caused by burning of demolition materials, explosives, material burned in connection with fire-fighting research, road surfaces, diseased animal carcases, and containers contaminated with pesticides or veterinary or agricultural toxic substances. These exemptions apply only if the relevant conditions are satisfied, and these in general are concerned with supervision of the fire and minimising smoke emission, unless this is contrary to safety or the purpose of the exercise.

(*f*) **Smoke Control Areas:**

Sections 11 to 15 of the Clean Air Act 1956, Sections 8 to 10 of the 1968 Act and Section 95 of the Housing Act 1964 relate to Smoke Control Areas, the administrative procedures and the enforcement of Smoke Control Orders.

Section 11 of the 1956 Act allows a Local Authority to make a Smoke Control Order which must be submitted to the Minister of Housing and Local Government for confirmation. When operative, it is an offence for an occupier of premises to allow smoke emission from a chimney, unless the smoke is caused by the use of an "authorised fuel"; or the "fireplace" which the chimney serves is exempt from the Order.

The Clean Air (Authorised Fuels) Regulations 1956, 1968, 1965 and 1969 allow the use of the following fuels in Smoke Control Areas, even though some may for short periods cause light smoke emission:—

Anthracite
Low Volatile Steam Coal
Phurnacite
Burnbrite
Cleanglow and Phimax
Coalite, Rexco & Rexco Ovoids
Gloco and gas coke
Homefire
Multiheat and Roomheat
Sunbrite and 'hard' coke
Cosiglow
Gas and electricity

} Manufactured Solid Smokeless fuels

In addition to the conditions shown in the table on the next page, two standard conditions require all appliances to be installed, maintained and operated

(i) so as to minimise the emission of smoke;

(ii) in accordance with the manufacturer's instructions as to operation (if any) or, in the case of the class of fireplace numbered 6 above, in accordance with such instructions of the National Coal Board.

The local authority may also include in the Smoke Control Order other exemptions, which they may feel are necessary, subject to reasonable conditions. One of these is to allow the lighting of domestic fires with sticks and paper if there is no gas in the dwelling.

Thus, although householders are generally required to use authorised smokeless fuels only, industry may use coal, oil or wood waste in exempted appliances which are substantially capable of smokeless operation. Where a householder wishes to use an exempted fireplace, such as an oil fired boiler, there can be no legal objection to his proposals.

The Smoke Control Areas (Exempted Fireplaces) Order 1970 (Statutory Instrument 1970 No. 615) which revokes the 1957, 1959, 1966 and 1969 Regulations conditionally exempts the emission of smoke from chimneys serving the following fireplaces:

	Class of Fireplace	*Conditions*
1.	Any fireplace specially designed for combustion of liquid fuel.	
2.	Any fireplace (other than a fireplace fired by pulverised fuel) constructed on or after 31st December 1956 and installed before 1st May 1970 and equipped with mechanical stokers, or adapted between those dates for use with such stokers.	No fuel shall be used other than that for which the mechanical stoker was designed.
3.	Any fireplace designed to burn coal (other than a fireplace fired by pulverised coal) with a heating capacity exceeding 150,000 Btu./hr. constructed and installed on or after 31st December 1956 and equipped with mechanical stokers or adapted on or after that date for use with such stokers.	
4.	The fireplace known as the Solid Fuel Ductair Unit, manufactured by Radiation Limited.	
5.	The fireplace known as the Fulgora Slow Combustion Stove, manufactured by Fulgora Stoves Ltd.	No fuel shall be used other than wood waste in clean condition.
6.	The fireplace known as the Housewarmer, manufactured for the National Coal Board by Ideal Standard Limited.	No fuel shall be used other than washed coal singles.
7.	The fireplace known as the Wood Chip Fired Air Heater, manufactured by Air Plants Ltd.	No fuel shall be used other than clean wood waste of a size within the limits referred to in the manufacturer's instructions.
8.	The fireplace known as the Hounsell Sawdust Burning Stove, manufactured by John Hounsell (Engineers) Limited.	No fuel shall be used other than wood waste in clean condition.

The 1968 Act extended the Smoke Control provisions of the 1956 Act. The Minister is now empowered to require a local authority to make Smoke Control Orders. It is also an offence to acquire unauthorised fuel or to sell by retail an unauthorised fuel for delivery in a Smoke Control Area, unless in each case the premises or fireplace are exempt.

The financial provisions of the 1956 Act require the local authority to pay to owners or occupiers of dwelling houses a grant of 7/10ths of the reasonable cost of fireplace adaptions, and they may repay all or any part of the remaining 3/10ths. The local authority recovers 4/7ths of the grant from the Exchequer. A grant is not available in respect of a "new dwelling" begun on or after 16 August 1964.

The Housing Act 1964 allows a local authority to "designate" as unsuitable any appliances for which suitable fuels are not fully available, and in those circumstances a grant is not available for installation of those appliances.

Section 10 of the 1968 Act prevents a local authority from postponing the operation of a Smoke Control Order by more than 12 months.

Grant Arrangements

The principles which local authorities must follow in assessing eligibility of works of adaptation for grant are contained in the Memorandum on Smoke Control Areas, revised by Ministry of Housing and Local Government Circular 51/65. In Circular 25/66 the Ministry set cost limits for local authority guidance in assessing "reasonable costs": —

Smoke Control Area Grants: Cost Limits for Various Appliances (Circular 25/66)

Improved open fire (including integral gas ignition and, where necessary deepening plate and bar)	6
Improved open fire (including integral gas ignition and, where necessary deepening plate and bar) with boiler	17*
Underfloor draught fire and fan assisted open fire	17
Underfloor draught fire and fan assisted open fire with boiler	23*
Solid fuel room heater	26
Solid fuel room heater with boiler	36*
Gas room heater	24
Electric thermal storage heater	29
† Electric fire	18
Oil room heater	16
Solid fuel cooker with boiler	60
Gas or electric cooker	35
Independent solid fuel boiler, **including installation**	25
Gas water heater (e.g. gas circulator and back boiler unit), **including installation**	25
Electric immersion water heater, **including installation**	15
Wash boiler, gas and electric	13
Gas poker, including flex and tap	2
Bottled gas igniter, if gas container is hired	3
Bottled gas igniter, including purchase of gas container	6
Electric kindler	8

* £2 may be added where

(i) it would be impossible or inadvisable to connect the existing boiler to the new space-heating appliance,

and

(ii) either

(*a*) the existing boiler is itself bower-barffed or made of stainless steel, copper, aluminium, bronze or other superior material, or

(*b*) one of the above types is necessary to comply with local water bye-laws.

† Circular HLG.46/68 (Welsh Office, Circular No. 40/68)

Circular HLG.46/68 (Welsh Office Circular No. 40/68)

It is for the local authority to decide, within the appropriate level, what costs are reasonable in each case. In general the Ministry will not accept as eligible for grant any expenditure which exceeds the stated limit.

(*g*) **Statutory Procedure in the Event of an Offence for Excessive Smoke Emission:**

Section 30 of the 1956 Act requires the local authority authorised officer (usually the Public Health Inspector) to notify "as soon as may be" the occupier of the premises of the offence and to confirm his notification in writing within 48 hours of becoming aware of the offence.

This requirement applies to a contravention of Section one and eleven of the 1956 Act, i.e. Dark/Black smoke emission, and smoke emission in a smoke control area, and to Section one of the 1968 Act, i.e. dark smoke emission from industrial or trade burning. In any subsequent proceedings it is a defence to prove that the notification was not made "as soon as may be" or that the notification was not confirmed within two days following the date of offence.

(*h*) **Statutory Smoke Nuisance:**

Part III of the Public Health Act 1936 defines certain statutory nuisances, and prescrribes the legal procedure for enforcing their abatement.

Section 16 of the Clean Air Act 1956 extends the provisions of Part II of the Public Health Act 1936, to include smoke nuisance, but a smoke nuisance cannot include:—

- (i) smoke emitted from a chimney of a private dwelling, or
- (ii) dark smoke from a chimney of a building or boiler or other plant (controlled) by Section 1 of the 1956 Act), or
- (iii) dark smoke caused by industrial or trade burning (controlled by Section 1 of of the 1968 Act).

Where a smoke nuisance exists, the local authority may pursue the lengthy and cumbersome nuisance procedure, but if they are satisfied that the nuisance has occurred, has temporarily ceased, but is likely to recur, they may, without serving an Abatement Notice, cause a complaint to be made to the Magistrate's Court for the making of a Nuisance Order, following which the provisions of Part III of the Public Health Act 1936 for enforcement of the Order will apply.

Summary of the Provisions Relating to Smoke Emission

A. New plant must be capable of substantially smokeless operation.

B. The proposed installation of new furnaces must be notified to the local authority.

C. There are permitted periods for dark and black smoke emission from chimneys, and these standards apply throughout England and Wales.

D. The Permitted Periods Regulations apply whether or not premises are subject to a Smoke Control Order, but additionally, if in a Smoke Control Area, the occupier must ensure that smoke emission is prevented, or, where plant or premises are conditionally exempted, he must ensure that smoke emission is minimised.

E. A grant of 7/10ths of reasonable expenditure is available for the adaptation or replacement of domestic coal burning and similar open fires in a Smoke Control Area.

F. Dark smoke emission from bonfires etc. on industrial or trade premises is, subject to any exemptions, prohibited.

G. The authorised officer must notify the occupier of premises as soon as may be of the existence of an offence, and must confirm his notification in writing within 48 hours.

H. Smoke, other than smoke emitted from a dwelling, dark smoke from a chimney or dark smoke from industrial or trade burning, may if it causes a nuisance be regarded as a Statutory Nuisance under the Public Health Acts.

2. The Control of Chimney Heights

At whatever height smoke and flue gases are discharged, gravity will eventually bring the larger particles of grit, dust and soot to the ground. Additionally, because of the natural turbulence of the atmosphere, a proportion of the gases and of the freely suspended fine particles will reach the ground although not affected by gravity. The higher the point of discharge and the greater the total heat content of the discharge gases, the more widespread and diluted will be the fine particles and gases by the time they reach ground level.

The Legal Control of Chimney Heights

The legal control of chimney heights enables the local authority to take into account a number of relevant factors in determining the height of a chimney to avoid down draught or down wash created by the chimney itself, by buildings or topographical features, and to avoid the ground level concentration of the products of combustion from becoming prejudicial to health or a nuisance, or in the case of smaller units to prevent the flue gases from entering nearby buildings in too high a concentration. All chimneys must comply with the structural requirements of the Building Regulations 1965, but the control of the height or position of the terminal is now exercised under the provisions of the Clean Air Act 1968 or the Building Regulations 1965, according to the fuel consumption of the plant served by the chimney. Further control is available in the Public Health Act 1961 when a new building is proposed which will over-reach the chimney of an adjacent building and affect the dispersal of the products of combustion.

(*a*) The Clean Air Act 1968—Section 6

This section of the 1968 Act amends and extends the provisions of Section 10 of the Clean Air Act 1956, which it has largely replaced (except to control the height of chimneys serving non-combustion processes).

Whereas by Section 10 of the 1956 Act a local authority could control a chimney height only if building plans indicating a proposal to erect a chimney were submitted for approval, it must now, under the new provisions, consider a chimney height when:—

A. a new chimney is erected to serve a new or existing furnace,

B. a furnace served by an existing chimney is enlarged, i.e. when its combustion space is increased, e.g. by the addition of a new furnace to an existing range of furnaces,

C. a furnace served by an existing chimney is removed and replaced by one having a larger combustion space,

but only if the furnace:—

(i) burns or is to burn pulverised fuel; or

(ii) burns or is to burn at a rate of 100 lbs. or more an hour any other solid matter; or

(iii) burns or is to burn at a rate equivalent to 1¼ million Btu. or more per hour any liquid or gaseous matter.

An application for chimney height approval should be on the form prescribed in the Clean Air (Heights of Chimneys) (Prescribed Form)

Regulations 1969 (Statutory Instrument 1969 No. 412) but this does not preclude the local authority from considering an application even though not on the prescribed form, if the information provided by the applicant is sufficient.

The local authority must consider an application and give a written decision within 28 days of receiving the application, unless it is agreed in writing between the local authority and the applicant that a longer period may be allowed; but the local authority must not approve the proposed chimney height unless they are satisfied that it will be sufficient to prevent so far as practicable the smoke, grit, dust, gases or fumes emitted from the chimney from becoming prejudicial to health or a nuisance, having regard to:—

(*a*) the purpose of the chimney,
(*b*) the position and descriptions of buildings near to it,
(*c*) the levels of the neighbouring ground,
(*d*) any other matters requiring consideration in the circumstances.

Any approval of the height of a chimney may be granted unconditionally or subject to conditions as to the rate and/or quality of emissions from the chimney.

> "rate of emission" is defined as the quantities of any specified substance which may be emitted in a period specified in the conditions attached to the approval, e.g. lbs./hr. of sulphur dioxide.

Many other miscellaneous emissions may, of necessity, be considered for inclusion in conditions as to the rate of emission, but there will be cases where a limitation on "rate" alone will not sufficiently ensure against excessive pollution by materials other than normal combustion products, and in those cases it might be appropriate to impose conditions as to the "quality" (i.e. concentration) of the emission.

A limitation on the quality of emission would be appropriate if the products of combustion contain gases or acid mists resulting from abnormal reactions or breakdown of materials derived from chlorinated or sulphur bearing compounds, etc., or if products of combustion are mixed with waste gases from non-combustion processes.

There will also be ocassions, particularly in relation to metallurgical processes, where the optical density of emissions may be regulated by reference to percentage obscuration or perhaps by reference to the Bacharach scale.

If a local authority fails to give a written decision within 28 days, the approval applied for is deemed to be granted without qualifications.

If the local authority decide not to approve the height of a chimney or to attach conditions to their approval, they must give the applicant a written notification of their decision, stating their reasons, and they must additionally specify the lowest height, if any, which they are prepared to approve unconditionally and/or the lowest height they are prepared to approve with any specified conditions. The applicant may, within 28 days, appeal against the decision to the Ministry or Housing and local Government, or the Secretary of State for Wales or for Scotland as appropriate.

In the event of an appeal being lodged, the Minister may confirm the decision against which the appeal is made, or may amend the height or conditions as he thinks appropriate. He must also give a written notification of his decision stating his reasons and, where he does not approve a chimney height, specifying what height, with and/or without conditions, he would approve.

It is not necessary to apply for chimney height approval for any exempted boiler or plant, and the Minister has made the Clean Air (Heights of Chimneys) (Exemption) Regulations 1969 (Statutory Instrument 1969 No. 411).

These Regulations provide in substance that chimney height approval is not required where a boiler or plant is used:—

(a) as temporary replacement for a boiler or plant which is being repaired, rebuilt, or replaced by another permanent boiler or plant;

(*b*) as a temporary source of heat or power for building or engineering construction work;

(*c*) as a temporary source of heat or power for investigation or research;

(*d*) as an auxiliary plant used to bring other plant to an operating temperature;

(*e*) as a mobile or transportable source of heat or power for agricultural operations.

Although a boiler or plant, when used wholly for one of the prescribed purposes, will be exempt from the provisions requiring the height of the chimney to be approved, it will nevertheless be subject to the other relevant provisions of the Clean Air Acts, and to the Nuisance Provisions of the Public Health Act 1936.

The Practical Determination of the Height of Chimneys Controlled Under the Clean Air Act 1968

Products of combustion emitted from chimneys serving furnaces burning conventional solid, liquid or gaseous fuels may contain:—

(*a*) *Solids*
Smoke, dust, ash, grit, fume.

(*b*) *Gases*
Carbon monoxide, carbon dioxide, water vapour, sulphur dioxide, oxides of nitrogen, hydrocarbons, oxygen and nitrogen; and a number of other minor constituents, including a host of trace elements.

By good combustion and the installation of efficient arrestors, the emission of solids, and to a lesser extent some of the gases, can be minimised, but removal of, for instance, sulphur dioxide is impracticable and the gases must therefore be discharged through a chimney of adequate height.

The basic thesis in the use of tall chimneys for waste gas dispersal is that there are no such things as dangerous gases or fumes, only dangerous concentrations.

The function of the chimney is to reduce the resulting ground level concentration of each constituent of the emission so that it is below the threshold which gives rise to a health hazard or a nuisance.

Under ideal conditions, and so far as gases are concerned, the ground level concentrations from a chimney discharge vary directly with the mass rate of emission and inversely with the wind speed and the square of the effective chimney height. Maximum ground level concentrations occur at about 10-15 times effective chimney heights distance.

Until the first edition of the Memorandum on Chimney Heights issued by the Ministry of Housing and Local Government in 1963, local authorities had a number of formulae which they could use for the calculation of a chimney height, particularly those recommended by the Beaver Committee in Appendix VI of its Final Report.

Revised in October 1967, the Memorandum on Chimney Heights still follows the basic principle in the amended edition that the pollution downwind from a chimney should not exceed a predetermined limit and that pollution from the chimney must be considered in relation to pollution which exists from other sources.

Using either an average sulphur content for coal and oil of 1·6% and 3% respectively, or preferably using the known sulphur content, it is easy to calculate the mass emission of SO_2 (not forgetting that in the case of coal, 10% of the sulphur remains in the ash). In practice, because of the tremendous variation in sulphur content of coal, it is usual to take the average of 1·6% for determining chimney heights, but to use the specification maximum for a particular class of oil when that fuel is to be used. It is also usual to base the fuel consumption on the M.C.R. of the boiler or other plant. Thus the chimney height is based on the maximum possible SO_2 emission from the plant and gives the industrialist some flexibility in the amount of fuel he might then burn without contravening the Act.

In the Memorandum, after the introduction of a description of the method, are printed a number of charts which allow firstly an uncorrected chimney height to be obtained based on SO_2 emission and the type of locality; and secondly a final height to be obtained by relating the uncorrected height to the height and/or length of the building in which the furnace is installed or the height of adjacent buildings.

An accurate assessment of the type of locality is important in determining the uncorrected chimney height, and the Memorandum gives the following guidance:—

A. An undeveloped area where development is unlikely, where background pollution is low, and where there is no development within half a mile of the new chimney.

B. A partially developed area with scattered houses, low background pollution, and no other comparable industrial emissions within a quarter of a mile of the new chimney.

C. A built-up residential area with only moderate background pollution and without other comparable industrial emissions.

D. An urban area of mixed industrial and residential development, with considerable background pollution and with other comparable industrial emissions within a quarter of a mile of the new chimney.

E. A large city, or an urban area of mixed heavy industrial and dense residential development, with severe background pollution.

Category C represents average conditions, whilst categories A, B, D and E represent adjustments up or down, according to probable existing background pollution. Thus a chimney will be lower in Area A than in Area C, and highest in Area E.

It is emphasised that the Memorandum provides a relatively simple method of calculating the approximate chimney height commonly desirable in normal circumstances. There will sometimes, however, be occasions involving complex developments, or topographical complications, which are impossible to assess precisely by either experience or mathematics and it will then be necessary to have wind tunnel tests carried out on scale models.

Heights of Chimneys Serving Furnaces Not Burning Conventional Fuels

The Memorandum can be utilised for determining stack heights only if the "fuel" is conventional, it contains sulphur in significant proportions, and there are no constituents of the chimney gases that are of more importance in relation to public health or nuisance than sulphur dioxide. Where there is no SO_2 emission, or where other constituents are of more importance, the height of the chimney cannot be assessed by use of the Memorandum on Chimney Heights.

(*b*) Clean Air Act 1956—Section 10

Although Section 10 of the 1956 Act no longer applies to a chimney serving a furnace, it will still apply to a chimney serving a non-combustion process, providing Building Regulation plans are required to be submitted for local authority approval. If the chimney is insufficient to prevent the emissions from becoming prejudicial to health or a nuisance, the local authority must reject the plans, an an aggrieved applicant may appeal to the Minister of Housing and Local Government.

(*c*) **The Building Regulations 1965**

Where the proposed chimney is to serve plant with a fuel consumption lower than that specified for Clean Air Act control, the proposed chimney must comply with the requirements of the building regulations 1965 in that the terminal must be correctly sited.

The Regulations require a flue outlet to comply with stringent specific requirements if the appliance is not a "high rating appliance".

In the case of a high rating appliance, which is defined as:—

(i) a solid fuel or oil burning appliance with an output rating exceeding 150,000 Btu/hr.,

(ii) a gas appliance with an input rating exceeding 150,000 Btu/hr.,

(iii) an incinerator with a refuse combustion chamber exceeding 3 cu. ft. capacity,

control is exercisable only if the premises are offices, shops or dwellings, and in these cases the chimney terminal must be so situated as to prevent the discharge therefrom into the external air from entering any opening in a building in such concentration as to be prejudicial to health or a nuisance.

(*d*) **Public Health Act 1961**

Section 28 of this Act applies when a new building is erected which will overreach the chimney of an adjoining building.

Providing that the chimney of the lower building is in the party wall between it and the taller building, or is 6 feet or less from the taller building, the local authority may by Notice require the person who erects the taller building to raise the height of the chimneys of the adjoining building if it is reasonably practicable to do so, so that the chimneys are the same height as the taller building or its chimneys, whichever is the higher.

The Notice will also require the owner or occupier of the adjoining building to allow the work to be done, but he may elect to do the work himself and charge the reasonable cost of so doing to the person on whom the Notice was served.

In the event of non-compliance with the Notice, the local authority may do the work in default.

It is essential to emphasise that whilst the physical and effective heights of any chimney are of importance in ensuring the eventual dispersion of the waste gases etc., other features of the chimney (e.g. its shape, quality of thermal insulation, and cross sectional area at the outlet) must be carefully designed if stack inversion, acid condensate, smut emission, and downwash are to be avoided.

Summary of the Provisions Relating to Chimney Heights

The occupier of premises must seek approval of a chimney height when:—

A. (i) a new chimney is to be erected,

(ii) an existing furnace installation is to be enlarged,

(iii) a furnace is to be replaced by one of larger combustion capacity,

but only if the new or enlarged plant is to burn pulverised fuel; other solid matter at 100 lbs, or more per hour; or liquid or gaseous matter at 1·25 million Btu. or more per hour.

B. The local authority must give a written decision within 28 days, and may prescribe conditions.

C. The applicant can appeal to the Minister of Housing and Local Government within 28 days of receiving the local authority decision if aggrieved by the decision or conditions.

D. Chimney height approval is not required for certain exempted plant—mainly of temporary or experimental nature.

E. If the proposed plant is below Clean Air Act size for chimney approval, but is a high rating appliance, and is to be installed in office, shop or residential accommodation, the position and height of the chimney terminal must comply with the Building Regulations 1965.

F. In general, the Ministry Memorandum on Chimney Heights is used, unless there are parameters more important than SO_2 emission which must be considered.

G. In some circumstances, the developer of a tall building may be required to raise the height of the chimneys of an adjoining building.

3. The Control of Grit, Dust and Fume Emissions

There are no legal definitions of either "grit" or "dust". Fume is defined in the 1968 Act as being "solid particulate matter smaller than dust".

It is, however, widely accepted that grit particles are those which are of a size 76 microns or above (i.e. will remain on a 200 mesh B.S. sieve) and dust particles are smaller than this size. At the lower size there is some difference of opinion whether or not "fume" commences at 10 microne or at 1 micron.

Under the provisions of the 1956 Act, the underlying principle in relation to stack solids was that any practicable means should be used for minimising grit and dust emissions. The various definitions recognised that technical problems would prevent the complete elimination of emissions and that the measures required would vary according to circumstances. The requirement for grit arrestors to be installed in connection with new plant related only to those burning pulverised fuel, or other solid matter at the rate of one ton or more per hour.

The 1968 Act provisions take these first principles a stage further and also allow the various provisions to be related to fume emission as and when the Minister feels the time to be appropriate.

The new provisions considerably strengthen and extend the local authority powers in relation to this problem, and since they are of fundamental importance, they are set down under a series of subheadings.

(1) Minister's Power to Prescribe Limits of Emission

Section two of the 1968 Act gives the Minister power to prescribe limits on the rates of emission of grit and dust from the chimneys of furnaces, and to prescribe different limits for different cases and according to different circumstances.

When the limits are prescribed, they will probably apply to both new and existing furnace installations (different limits may apply in either case), but in the event of emissions exceeding the prescribed limit it will be a defence to prove that the best practicable means had been used for minimising the emission.

These powers are available to prescribe maximum emissions from a chimney serving any furnace burning solid, liquid or gaseous matter (except domestic boilers with a rating less than 55,000 Btu/hr.).

Until limits are prescribed in relation to any plant, *any* practicable means there may be must be used to minimise the emissions.

(*a*) Proposed Standards of Emission

In September 1964 a Working Party on Grit and Dust Emissions was set up:—

> "To consider ways and means of measuring grit and dust emissions and to advise on the levels of emission admissible in relation to furnaces burning

fuel equivalent to 100 to 50,000 lbs./hour of coal."

The Report was published in 1967, and in addition to making observations and recommendations relating to the measurement of emissions, it made recommendations as to the acceptable level of emissions from solid fuel and oil fired boilers and from furnaces where the stock being heated does not contribute to the emissions.

The working party considered that there was insufficient reliable data of emissions from furnaces where the stock contributed to emissions, or from incinerators, and recommended that there should be initiated a systematic study to obtain emission data from a representative sample of these classes of furnaces and, at the same time, to obtain some reliable information on the current technology of emission prevention. This study has recently been undertaken by N.I.F.E.S.

(i) Recommended Maximum Emission from Solid Fuel Fire Boilers

The recommendations were stated in lbs./hour of grit and dust emitted during a period of normal operation, including peak loads.

(*a*) For plant burning between 100 lbs. and 670 lbs. per hour of solid fuel (750 lbs. steam to 5,000 lbs.. steam per hour f & a 212°F) the maximum emission to be 1% of the weight of the fuel burned (i.e. 1 lb./hr. to 6·7 lbs./hr.).

(*b*) For plant burning between 670 lbs. and 50,000 lbs. per hour of solid fuel (5,000 lbs. steam—450,000 lbs. steam per hour f & a 212°F), the maximum percentage emission to reduce from 1% of the weight of the fuel burned at the lower end of the range to 0·5% of the fuel burned at the top end of the range (i.e. 6·7 lbs./hour to 250 lbs./hour).

(ii) Recommended Maximum Emission from Oil Fired Boilers

As with solid fuel, the recommendations were stated in lbs./hour of stack solids during a period of normal operation, including peak loads.

(*a*) For boilers with M.C.R.'s up to 40,000 lbs. steam/hour f & a 212°F, the maximum emission to be 0·4% of the fuel burned at M.C.R.

(*b*) For boilers with M.C.R.'s between 40,000 lbs. steam/hour and 475,000 lbs. steam/hour f & a 212°F, the acceptable emission expressed as a percentage of the fuel burned decreases steadily from 0·4% at the lower end to 0·2% at the top of the range.

(iii) Recommended Maximum Emissions from Coal Fired and Oil Fired Furnaces Where the Stock Does not Contribute to the Emissions

There is no common basis for the rating of a very wide range of type and size of furnace in relation to output, and the recommendations are, therefore, expressed as lbs./hour of emissions relating to the heat input in Btu/hr.

The standards of emission for both coal fired and oil fired furnaces are based on a straight conversion of M.C.R. f & a 212°F of the boiler standards, to the quivalent in Btu/hour.

In respect of coal fired plant, the Working Party recommended that the percentage "grit" in the sample from plants burning up to 1 ton/hour should not exceed 33%; and from plant burning more than 1 ton/hour should not exceed 20%.

These standards of acceptable emission of grit and dust were endorsed by the Ministry of Housing and Local Government in their publication "Grit and Dust—The Measurement of Emissions from Boiler and Furnace Chimneys—Standard Levels of Emission".

The definition of "practicable" in the 1956 Act (it applies also to the 1968 Act) is of importance.

"practicable" means reasonably practicable having regard amongst other things to local conditions and circumstance, to the financial implications and to the current state of technical knowledge, and *"practicable means" includes the provision and maintenance of plant and the proper use thereof.*

(2) **Arrestment Plant for New Furnaces**

Section 6 of the Clean Air Act 1956 required that certain larger new furnaces, the installation of which was commenced (or was subject to an agreement signed) between July 1956 and October 1969, should be equipped with approved grit and dust arrestment plant and that the arrestors must be properly maintained and used. These provisions still apply to furnaces which are used:—

(*a*) to burn pulverised fuel; or
(*b*) to burn, at a rate of one ton an hour or more solid fuel in any other form or solid waste,

providing that the plant was installed or an agreement was signed between the above-mentioned dates.

Section 3 of the 1968 Act states that if new plant is to be installed after the 1st October 1969 (or is subject to an agreement signed after that date) and it is to be used

(*a*) to burn pulverised fuel; or
(*b*) to burn, at a rate of 100 pounds or more an hour, any other solid matter; or
(*c*) to burn, at a rate equivalent to 1¼ million or more British thermal units an hour, any liquid or gaseous matter,

it must, unless exemption has been provided, be equipped with local authority refusing approval, there is a right of appeal to the Minister within 28 days of receiving the local authority's written decision.

Two types of exemption are possible by virtue of Section 4 of the 1968 Act:—

(i) The Minister has power to provide in Regulations that furnaces of any particular class, whilst used for a prescribed purpose, should be exempted. He has now made the Clean Air (Arrestment Plant) (Exemption) Regulations 1969 (Statutory Instrument 1969 No. 1262) as follows:—

Class of Furnace	*Purpose*
1. Mobile or transportable furnaces	(*a*) Providing a temporary source of heat or power during any building operation or work of engineering construction (within the meaning of section 176 of the Factories Act 1961; (*b*) providing a temporary source of heat or power for investigation or research; (*c*) providing heat or power for the purpose of agriculture (within the meaning of section 109(3) of the Agriculture Act 1947)
2. Furnaces, other than furnaces designed to burn solid matter at a rate of one ton an hour or more, which fall within any of the following descriptions and in which	

the matter being heated does not contribute to the emission of grit and dust:—	
(*a*) Furnaces burning liquid matter gas, or liquid matter and gas	
(*b*) hand-fired sectional furnaces designed to burn solid matter at a rate of not more than 25 lbs. an hour for each square foot of grate surface	Any purpose except the incineration of refuse
(*c*) magazine type gravity-fed furnaces designed to burn solid matter at a rate of not more than 25 pounds an hour for each square foot of grate surface	
(*d*) furnaces fitted with an underfeed stoker designed to burn solid matter at a rate of not more than 25 pounds an hour for each square foot of the plan area of the combustion chamber	
(*e*) furnaces fitted with a chain grate stoker designed to burn solid matter at a rate of not more than 25 pounds an hour for each square foot of grate surface	Any purpose except the incineration of refuse
(*f*) furnaces fitted with a coking stoker designed to burn solid matter at a rate of not more than 25 pounds an hour for each square foot of area covered by the fire bars excluding the solid coking plate.	

(ii) The local authority may, on application, exempt a specific furnace installation providing that they are satisfied that the emissions will not be prejudicial to health or a nuisance. The local authority must give a written decision within eight weeks, and an aggrieved applicant may appeal within a further 28 days, to the Minister.

An offence occurs if a furnace is exempt and is then used for a purpose other than one prescribed in the exemption.

When considering an application for approval of a proposed arrestor plant (or an application for exemption from the need to install an arrestor plant) the local authority will have regard to the probable grit and dust burden in the flue gases, and to the known efficiency of the proposed arrestor plant in order that they might compare the probable emission with any standard which might at that time be in force or which is under active consideration. Industrialists and consultants would, in turn, be wise to remember that the standards at present proposed are to be reviewed after three years in operation, and that arrestor plant, unless very well maintained at all times, rarely operates at design efficiency after a few years in use.

(3) The Measurement of Grit and Dust Emissions

The legal provisions concerning the measurement of grit and dust emissions are to be found in Section 7 of the 1956 Act as amended by Section 5 of the 1968 Act. Regulations have been made which prescribe the procedure to be followed by a local authority which wishes grit and dust measurement to be made and by the industrialist on whom a Notice has been served.

If a furnace (or range of furnaces served by one chimney) is used to burn—

(*a*) pulverised fuel, or
(*b*) any other solid matter at a rate of 100 lbs. or more per hour, or
(*c*) any liquid or gaseous matter, at a rate equivalent to $1\frac{1}{2}$ million Btu/hour,

the local authority may serve a Notice on the owner of the plant or occupier of the building, requiring grit and dust emissions to be measured.

If the plant burns:—

(*a*) less than one ton/hour of solid matter other than pulverised fuel, or
(*b*) less than 28 million Btu/hour of liquid or gaseous matter,

the industrialist may serve a "Counter Notice" on the local authority, requiring the authority to carry out the measurements at its own expense, and the local authority is obliged to do so "from time to time" unless the Counter Notice is, in writing, withdrawn.

The Clean Air (Measurement of Grit and Dust) Regulations 1968, (Statutory Instrument 1968 No. 431), prescribe the administrative process to invoke the above provisions (a similar set of Regulations apply to Scotland):

(*a*) A local authority must give at least six weeks Notice in writing to an industrialist requiring:—
  (i) adaptations to be made to the chimney or flues, and
  (ii) the provision of the necessary equipment,

  to enable measurements to be made in accordance with BS.3405:1961 "Simplified Methods for Measurement of Grit and Dust Emission from Chimneys". The British Standard described five different types of equipment which can be used, and it is necessary to ensure that the type and position of sampling points is correct in relation to the type of equipment which will be used.

(*b*) When the sampling points have been installed and the equipment provided (or it is known that the firm are engaging a consultant who possesses the equipment), the local authority must give at least 28 days Notice in writing, requiring the tests to be carried out in accordance with the methods detailed in pp.13-26 of the B.C.U.R.A. publication "Measurement of Solids in Flue Gases".

(*c*) Before making the measurement, the industrialist must give the local authority at least 48 hours Notice in writing, of the date and time of the commencement of the tests.

(*d*) The 1968 Act requires the industrialist to permit the local authority to be represented during the tests.

(*e*) The results of the test must be sent to the local authority within 7 days from the making of the measurements, and the report shall include:—
  (i) the date(s) of the test(s)
  (ii) the number of furnaces discharging into the chimney on that date,

(iii) the results of the measurements expressed in lbs./hr. of grit and dust emitted, and in the case of solid fuel fired boilers, the percentage of grit in the solids.

A Notice may require the making of measurements from time to time or at stated intervals, but not at intervals of less than 3 months unless in the opinion of the local authority, the true level of emission cannot be determined without further measurements being made.

If an industrialist serves a "counter-notice" on the local authority, he need comply only with *(a)* (i) above, i.e. make adaptations to the chimney to enable the measurements to be made, including the provision of scaffolding where necessary, and the provision of facilities such as electrical connections to enable the sampling equipment to be used. The local authority must provide the sampling equipment and conduct the test entirely at its own expense.

The Clean Air (Measurement of Grit and Dust) Regulations were originally made before the 1968 Act became operative, when industrialists could be required only to sample emissions from pulverised fuel fired plant, or plant burning at least one ton per hour of other solid matter, and are currently under review to bring them into line with 1968 Act provisions.

In various circulars and publications, the Ministry of Housing and Local Government, and the Working Party have emphasised that the measurement of grit and dust emissions is both time consuming and costly. It is unlikely, therefore, that local authorities will authorise the indiscriminate service of hundreds of Notices on industrialists, but will concentrate in the first instance on those units which are thought to be giving rise to complaint of nuisance, or which they suspect are emitting solids grossly in excess of the proposed limits. In any event the majority of local authorities have still to arrange for their staff to be trained in the use of the sampling equipment.

(4) **Fume Emission**

Fumes are defined in the 1968 Act as "any airborne solid matter smaller than dust", and by this definition acid mist or liquid droplets are thereby excluded.

By virtue of the 1968 amendment to the definition of chimney in the 1956 Act, this now "includes structures and openings of any kind from or through which smoke, grit, dust or fumes may be emitted, and in particular includes flues".

There are, at the moment, no legal provisions which require the reduction or elimination of fume emissions, other than those specific fumes which are controlled by the Alkali Inspectors under the provision of the Alkali &c. Works Regulation Act 1906, as amended and extended by the Clean Air Acts 1956 and 1968, and by the Alkali Works Order 1966.

An important provision in the 1968 Act for possible future consideration is the power in Section 7 of the Minister to apply to "fumes", certain provisions of the 1956 and the 1968 Acts, i.e. by Regulations the Minister may apply the following provisions to fumes, as they apply to grit, dust or smoke:—

(a) *Clean Air Act 1956*
Section 3 — Requirement that new furnaces shall be so far as practicable smokeless "*and fumeless*".

(b) *Clean Air Act 1968*
Section 2 — Emissions of grit, dust "*and fumes*" from furnaces (standard levels of emission).
Section 3 — Requirements to fit arrestment plant (*including fume arrestors*) to new furnaces.

Additionally, the Minister has power to extend certain exemption provisions so that the exemptions relate to fume emissions or avoid the need to install fume arrestment plant.

4. Miscellaneous Provisions of the Clean Air Acts 1956 and 1968

A. The Clean Air Act 1956

Section 4—Smoke Density Meters

This Section enables the Minister of Housing and Local Government to make Regulations requiring the installation, maintenance and use of smoke density meters and/or recorders obligatory.

No regulations have yet been made and it is thought that this is because, although smoke density meters can be fairly reliable, they are easily subjected to abuse and the results obtained can be varied almost at will by altering the calibration or failing to clean the viewing glasses, etc., covering the light source or receiver.

Section 8—Information About Furnaces and Fuel Consumed

There is power in this section for a local authority to require an industrialist to supply information within 14 days as to the size of furnaces and fuel consumption but this information, in the vast majority of cases is provided willingly and voluntarily.

Section 18 — Colliery Spoilbanks (Including Waste Quarry-Shale)

Where a spoilbank is emitting smoke and fumes, or is likely to emit smoke and fumes, the following provisions apply:—

(*a*) *A spoilbank in use as at 5 July, 1956, or commenced since that date*

The owner of the mine or quarry is required to employ all practicable means for preventing spontaneous combustion and for preventing emission of smoke and fumes.

(*b*) *A spoilbank the use of which had ceased by 5 July, 1956*

If the spoilbank was no longer in use and its control had passed from the owner of the mine or quarry on or before the 5 July, 1956, the problem must be dealt with as a statutory nuisance under the provisions of Part III of the Public Health Act 1936 as amended.

Section 19—Railway Engines

Railway engines are subject to the dark smoke provisions of Section one of the 1956 Act, but are not subject to grit and dust emission provisions, nor to a Smoke Control Order.

Section 20—Vessels

Emission of smoke from vessels has been considered on a previous page.

Section 21—Exemption for Purposes of Investigation and Research

This section gives the local authority power to exempt a particular chimney, boiler or furnace etc. from varying provisions of the Act when it is expedient to do so, to enable investigations or research relevant to air pollution to be carried out without rendering the applicant liable to proceedings.

If the local authority refuse exemption, the applicant has a right of appeal to the Minister of Housing and Local Government.

Section 22—Crown Premises

In the event of excessive smoke, grit and dust from Crown premises, the local authority should notify the Minister responsible for the premises and he shall take appropriate action to prevent or minimise the emission.

Section 23—Clean Air Council

By means of this section the Minister of Housing and Local Government has established the Clean Air Council with one of his Junior Ministers as Chairman to review progress and obtain advice on air pollution matters. There is also a Clean Air Council for Scotland (Statutory Instrument 1957 No. 766).

Sections 25-29

These sections are mainly administrative and relate to research and publicity, improper disclosure of information by an officer, penalties for offences under the Act (Some of which have been increased by the

Criminal Justice Act 1967) authorisation of works, and enforcement of the Act.

B. **The Clean Air Act 1968**

The only important provision of this Act not previously mentioned is contained in section II and relates to registered processes under the Alkali Act. The section substantially repeals section 17 of the 1956 Act, and in particular removes the power of the local authority to apply to the Minister for authority to institute proceedings in the event of excessive smoke, grit, dust etc., from registered processes. It also brings within the control of the Alkali Acts "work subject or potentially subject to the Alkali Act".

Building Regulations—Prevention of Smoke Emission

The Building Regulations 1965, include a section, M2, relating to the prevention of emission of smoke. This supersedes the earlier byelaw on the subject. The full text of the section is:

> "M2. In any building (other than a building erected under former control) there shall not be installed for the purposes of heating or cooking in that or any other building any appliance which discharges the products of combustion into the atmosphere, unless that appliance is designed to burn as fuel either gas, coke, or anthracite. Provided that nothing in this regulation shall prohibit the installation of:
>
> (i) a furnace which complies with Section 3 of the Clean Air Act 1956; or
>
> (ii) any appliance of a class exempted conditionally or unconditionally from the provisions of Section 11 of the Clean Air Act 1956 (which relates to smoke control areas) by any order for the time being in force under subsection (4) of that section; or
>
> (iii) a solid fuel appliance with a bottom grate unsuitable for burning coke or anthracite but designed so as to be capable of use with an alternative bottom grate which is suitable for burning such fuel.

5. Road Traffic Pollution Law

Despite world-wide opinion that emissions from motor vehicles exhausts must be strictly controlled if the urban environment is to be improved, no effective legislation exists in the United Kingdom to deal with this problem, other than that of smoke pollution.

The Minister of Transport has made The Motor Vehicles (Construction and Use) Regulations 1969 (statutory Instrument 1969 No. 321) in which clauses 24, 25, 26 relate to the construction of the vehicle to avoid emissions, and clauses 84 and 85 to the actual use of the vehicle on the road.

Clause 24 requires every motor vehicle to be so constructed that no avoidable smoke or visible vapour is emitted.

Clause 25 refers to compression ignition (diesel) engines and requires excess fuel devices, for easy starting, to be so fitted that they cannot be operated by a person whilst he is being carried by the vehicle, unless (*a*) the device cannot be used after the engine has been started, or (*b*) does not cause any increase in smoke or visible vapour.

Clause 26 relates to those motor vehicle using solid fuel. Such vehicles must be fitted with efficient spark or grit arrestors and with a tray or shield to prevent ashes and cinders from falling onto the road.

Clause 84 requires that no person shall use or cause or permit to be used on a road any motor vehicle from which any smoke, visible vapour, grit, sparks, ashes, cinders, or oily substance is emitted if the emission thereof causes or is likely to cause damage to any property or injury to any person who is actually at the time or who reasonably may be expected on the road, or is likely to cause danger to any such person as aforesaid.

Clause 85 requires the excess fuel device of a compression ignition (diesel) engine to be so maintained that it does not cause the engine to be supplied with excess fuel and requires that no person shall use the device, or cause or allow it to be used, to supply the engine with excess fuel whilst the vehicle is on a road.

6. The Alkali, etc., Works Regulation Act

The Alkali, etc., Works Regulation Act, 1906, consolidates and extends previous similar Acts, the first of which was passed in 1863.

The Act includes a schedule of chemical processes and a list of noxious or offensive gases. Since 1906, this schedule and list have been extended by Statutory Orders made under the Public Health (Smoke Abatement) Act, 1926, and the Alkali, etc., Works Regulation (Scotland) Act, 1951. Such orders were made in 1928, 1935, 1939, 1950, 1958, 1961, 1963 and 1966.

The essence of the Act lies in the requirements that (1) scheduled processes must be registered annually; (2) as a prior condition in the case of a first registration the scheduled process must be provided to the satisfaction of the Chief Inspector with the "best practicable means" for preventing the escape of noxious or offensive gases to the atmosphere and for rendering such gases harmless and inoffensive; (3) the "best practicable means" must thereafter be maintained in good and efficient working order and must be operated continuously; (4) in the case of certain processes, upper limits are specified for the concentration of total acidity in effluent gases which may be discharged to the atmosphere.

Provision is made for the setting up and maintenance of an inspectorate to administer the Act, and regulations are included relating to the registration and inspection of works, general procedure, penalties, etc. The Chief Inspectors are required to make an Annual Report to be laid before Parliament, relating to the work of the inspectorate.

Under the Clean Air Act, 1956, the provisions of the Alkali Act are extended to apply to smoke, dust and grit from premises controlled under the Act as they already do to noxious or offensive gases. Thus from 31 December 1956 virtually all forms of air pollution from processes registered under the Alkali Act are subject to control under that Act by the Alkali Inspectorate. Any other parts of a work are the responsibility of the local authority.

The Alkali, etc., Works Orders

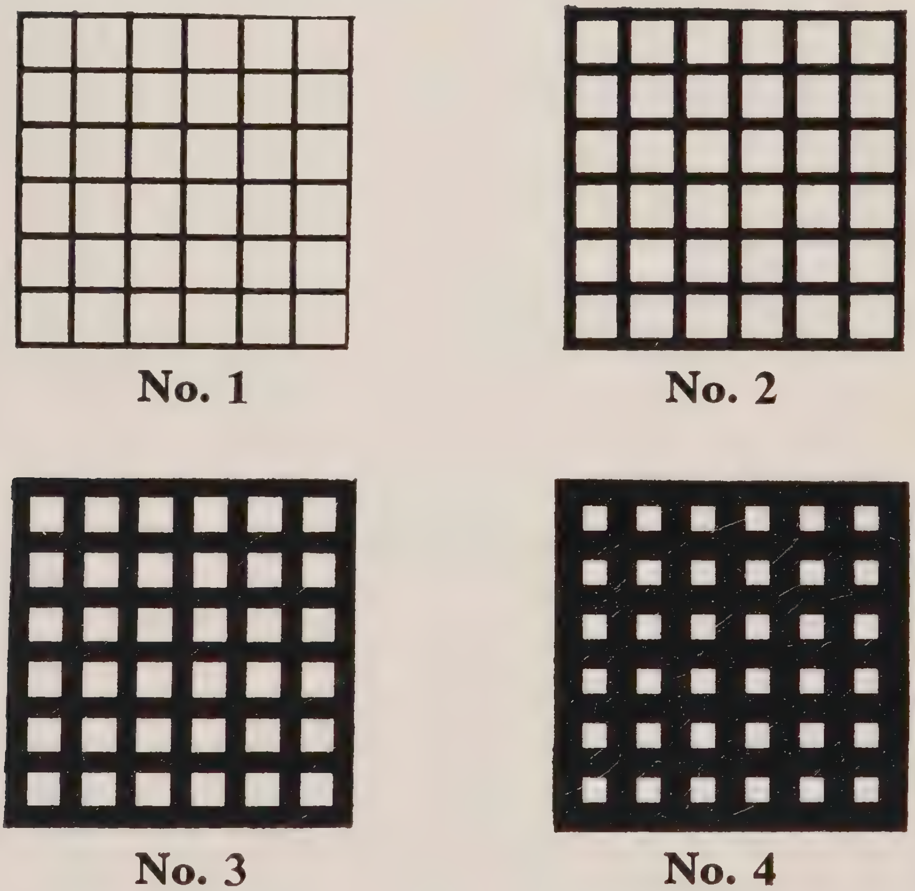
The first four Orders dealt mainly with processes in the heavy chemical and related industries where noxious or offensive gases are the potential offenders. In an Order which came into operation on 1 June 1958 the Minister of Housing and Local Government further extended the Alkali Act by adding to the list of scheduled processes a number which are responsible principally for emissions of smoke, grit and dust. Among these processes are a number for the production of iron and steel, iron or steel melting processes, and some copper and aluminium processes. Gas and coke works, electricity works, coal fired producer gas plant and lime kilns and certain ceramic kilns fired by coal or oil were also added to the list together with sulphate reduction and caustic soda plant and certain types of chemical incinerators. The Order also made the appropriate additions to the list of noxious or offensive gases.

The 1961 Order deals with

emissions from the processing of uranium, beryllium, selenium and their compounds. The 1963 Order is much more comprehensive and was prepared largely to take into account the major changes which have taken place in recent years in the heavy chemical and allied industries. It also covers the burning of scrap cable to remove the insulation. This is necessary because of the increasing amount of cable covered with polyvinyl-chloride, which, on burning, gives rise to hydrochloric acid, chlorides and possibly phosgene. The Order begins the policy of de-scheduling certain of the 1958 Order smoke processes.

The 1966 Order is important, for in addition to making a few minor alterations to the lists of scheduled works and noxious or offensive gases, it revokes all the earlier seven Orders and consolidates them in the 1966 Order. Thus, all the Alkali Acts and Orders since 1863 are consolidated in the 1906 Act and the 1966 Order.

The Ringelmann Chart



No. 1 **No. 2**

No. 3 **No. 4**

The Ringelmann chart, by means of which dark smoke is defined in the Clean Air Act, consists of the above four shades, which when viewed from a sufficient distance appear as varying tones of grey. They show 20, 40, 60, and 80 per cent blackness. The charts are 4 in. square, and are viewed, in line with the smoke being observed, at about 50 ft. from the observer. A full specification for production and use is given in B.S. 2742C. The standard chart is published in Britain by Charles Griffin & Co. Ltd., 42 Drury Lane, London, W.C.2. A pocket-size facsimile the "Microringelmann" is published by the U.S. journal "Power" (McGraw-Hill). Copies of both charts may be purchased from the Society. (See Guide to Publications, following, for prices.)

Estimates of Air Pollution in Great Britain

Table 1.—**Main Uses of Primary Forms of Energy in the United Kingdom in 1938, 1960 and 1968 in Million Metric Tonnes (one metric tonne = 0·9842 long ton)**

Derived by Dr. Albert Parker, C.B.E., from Statistical Digests of Ministry of Power

Year	*1938*	*1960*	*1968*
Coal			
Domestic, including miner's coal	51·2	36·1	23·6
Electricity power stations	15·1	52·7	74·4
Railways	13·4	9·0	0·2
Collieries	12·1	5·1	2·4
Industrial and miscellaneous	48·0	42·4	26·8
Coke ovens	19·4	29·3	25·3
Gas supply industry	19·4	23·0	10·9
Low temperature carbonization plants	—	0·9	2·2
Manufactured fuel plants	—	1·4	1·3
	178·6	199·9	167·1
Coke (excluding consumption in gas works and blast furnaces)			
Domestic, including other manufactured solid smokeless fuels	3·0	4·8	6·4
Industrial and miscellaneous	8·0	10·6	6·0
Oil			
Domestic	0·6	1·5	2·4
Industrial and commercial	1·4	24·1	43·6
Gas supply industry	0·1	0·8	5·5
Road transport	5·3	10·2	17·7
Railways	—	0·3	1·0
Marine craft (inland)	0·1	1·1	1·0
	7·5	38·0	71·2
Hydro-electricity (coal equiv.)	0·7	1·7	2·2
Nuclear-electricity (coal equiv.)	—	0·9	10·3
Natural gas (coal equiv.)	—	0·1	4·4
Total coal equivalent, including oil at 1 tonne equal to 1·7 tonnes of coal	192·1	267·2	305·0

Table 2.—Estimates of Air Pollution by Smoke and Sulphur Dioxide in Million Metric Tonnes from the Main Uses of Fuels in the United Kingdom in 1938, 1960 and 1968

Estimates prepared by Dr. Albert Parker, C.B.E.

Year	*1938*	*1960*	*1968*
Smoke			
Coal			
Domestic, including miners' coal	1·74	1·21	0·75
Railways	0·26	0·07	small
Industrial and miscellaneous	0·75	0·19	0·09
Total	2·75	1·47	0·84
Sulphur dioxide			
Coal			
Domestic, including miners' coal	1·23	0·92	0·60
Electricity power stations	0·41	1·56	2·11
Railways	0·37	0·26	0·01
Collieries	0·32	0·14	0·07
Industrial and miscellaneous	1·35	1·22	0·77
Coke ovens	0·07	0·11	0·09
Gas supply industry	0·14	0·16	0·07
	3·89	4·37	3·72
Coke			
Domestic, including other manufactured solid smokeless fuels	0·06	0·10	0·14
Industrial and miscellaneous	0·18	0·26	0·15
	0·24	0·36	0·29
Oil			
Domestic	—	small	0·01
Industrial and commercial	0·05	1·17	2·01
Road and rail transport	0·01	0·05	0·09
Marine craft (inland)	—	0·04	0·02
	0·06	1·26	2·13
Overall total	4·19	5·99	6·14

The amount of 43·6 million tonnes of oil used in 1968 for industrial and commercial purposes is equivalent in heating value to about 74 million tonnes of coal, which if used for the same purposes would have produced about about 0·2 million tonnes of smoke and about 2 million tonnes of sulphur dioxide.

In general over the period 1938 to 1968 the rise in the quantity of sulphur dioxide discharged has been approximately in proportion to the rise in the coal equivalent of the energy consumption; but there has been a decline from 6·5 million tonnes in 1965 to 6·1 million tonnes in 1968 and in the amount expressed as a percentage of the total coal equivalent. With further increase in the use of nuclear-electricity and natural gas and decreases in the sulphur content of industrial fuel oils, partly with changes in the sources of the oils, there will be further reductions in the amount of sulphur dioxide discharged into the air. With the decrease in the amount of sulphur dioxide discharged from low domestic chimneys and from railway engines and the move towards higher chimneys for installations burning large quantities of coal and industrial fuel oils, there has been a reduction in the concentration of sulphur dioxide in the air near ground level; this reduction will continue.

Grit and Dust

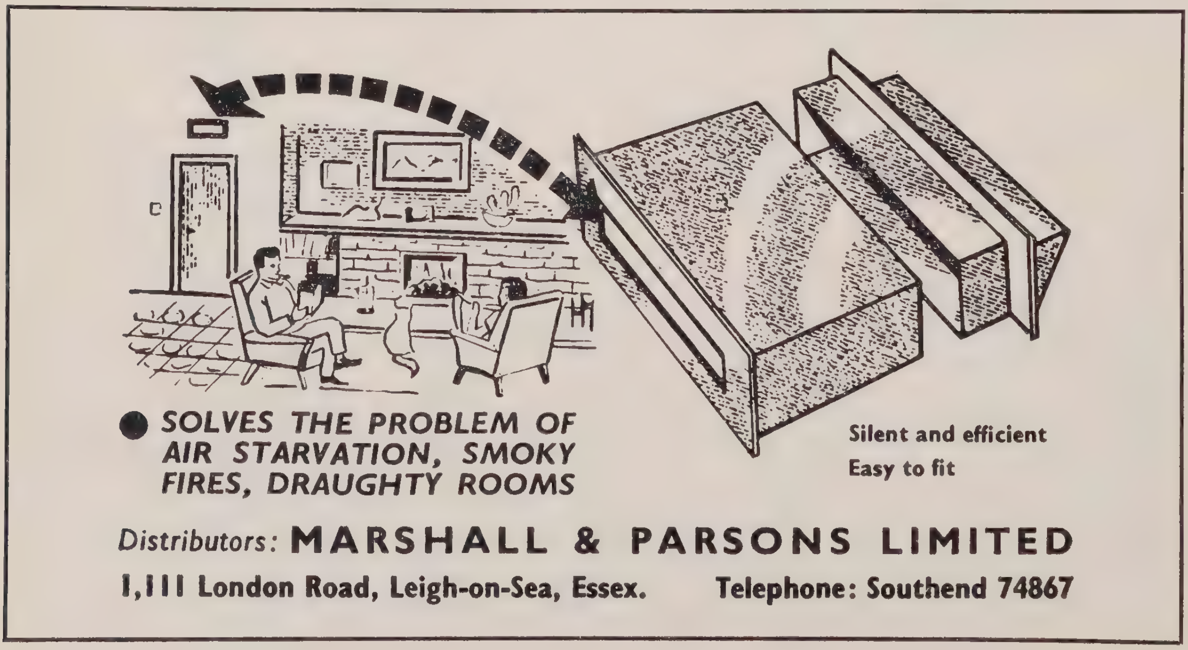
In the absence of numerous measurements of the discharges of grit and dust from each of the various uses of solid fuels it is possible to make only rough estimates of the quantities of grit and dust discharged into the air. My estimate is that in 1938 the total amount was in the region of 0·65 million tonnes, of which nearly one quarter was from each of the following, domestic fires, electricity power stations, and railways and about one-third from the industrial uses of coal and coke. For 1960 the estimated total is 0·8 million tonnes including one half from electricity power stations, one quarter from the industrial uses of coal and coke and the remainder divided equally between domestic fires and railways. For 1968 the estimated total is about 0·6 million tonnes with somewhat more than one half from electricity power stations, one-third from the industrial uses of coal and coke and one-sixth from domestic fires. In addition there are discharges of considerable quantities of grit and dust from various industrial processes, including cement works and iron and steel works for example. The total quantity now discharged from these various special processes is probably in the region of 0·5 million tonnes per annum.

Table 3.—**Estimates of Pollutants from Road Vehicles in the United Kingdom in 1968 in Million Tonnes**

Consumption of Motor Spirit	13·01 million tonnes
Consumption of Derv Fuel	4·65 million tonnes

Pollutant	*Petrol Engines*	*Diesel Engines*
Carbon monoxide	6·1	0·10
Hydrocarbons	0·30	0·18
Aldehydes	0·01	0·003
Oxides of nitrogen	0·21	0·05
Sulphur dioxide	0·02	0·03

The estimated quantity of carbon monoxide discharged into the air from the other industrial and domestic uses of all fuels in 1968 is about 11 million tonnes including nearly 5 million tonnes from domestic heating appliances.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The Cost of Air Pollution

The most recent general inquiry into the cost of air pollution in Britain was made by a sub-committee of the Committee on Air Pollution (the Beaver Committee), the findings of which were included as an appendix in the final report of the Committee in 1954. Members of the Committee have since stated that they consider the estimates to be too conservative. The total cost is now of the order of at least £350 million a year.

The main conclusions of the Report were:

(1) The direct costs of pollution to which figures can be put ("however hazardous") are as follows:

	£m. per annum
Laundry	25
Painting and decorating ...	30
Cleaning and depreciation of buildings other than houses	20
Corrosion of metals	25
Damage to textiles and other goods	52·5
	152·5

It is considered that these figures are underestimates, and as certain items have been omitted, it is concluded that the direct costs of air pollution are *of the order of at least £150 million a year.*

(2) The "loss of efficiency". The following figures are given as "a rough guess at possible orders of magnitude": £10m. a year loss to agriculture; £55m. a year loss of working efficiency in manufacturing industry; £60m. a year in other sections, including transport—altogether "the loss of efficiency resulting from pollution might be as great as the direct costs", but to avoid danger of over-estimates a figure of £100m. a year is suggested.

(3) The value of the fuel lost under the conditions which produce smoke is estimated to be £25m. to £50m. a year, but it is considered that this should not be included as one of the costs of pollution.

The total estimated cost is given as £250m. a year, equivalent to £10 per head in the black areas and £5 elsewhere throughout Great Britain, plus the value of the fuel lost.

Cost of Air Pollution Control

The amount of money spent by scheduled works in capital and working costs since the 1958 Alkali and Works Order has been estimated from the returns submitted and is summarised in the table below. Working costs include depreciation and interest, operations, maintenance and repairs, overheads and miscellaneous.

(From the 105th Annual Report of the Chief Alkali Inspector, 1968)

Works	*Capital*	*Research and Development*	*10-year Working Costs*	*Latest year's Working Costs*
1. Electricity	75,731,000	856,000	126,691,000	15,300,000
2. Cement	6,216,000	301,000	6,442,000	1,000,000
3. Petroleum	6,822,000	536,000	11,667,000	1,788,000
4. Gas	2,839,000	—	4,474,000	350,000
5. Coke Ovens	2,909,000	242,000	6,126,000	710,000
6. Lime	976,000	4,000	707,000	118,000
7. Ceramics	2,090,000	163,000	3,011,000	382,000
8. Iron and Steel ..	26,430,000	1,235,000	93,351,000	10,364,000
9. Non-ferrous Metals ..	5,762,000	656,000	16,449,000	2,262,000
10. Chemical	20,527,000	952,000	55,516,000	6,782,000
TOTALS (£)	150,302,000	4,945,000	324,434,000	39,056,000

Southport Conference

Special Train from London

Subject to there being sufficient demand the Society will arrange for first and second class reserved coaches to be attached to the train departing from Euston at 11.00 on Monday, 19 October, arriving at Southport at 14.50. The return again in special reserve coaches would be from Southport 13.30 on Friday, 23 October arriving at London, Euston at 17.10. The first-class return fare is £5 7s. 6d and a second-class fare is £4.

Monday 19 October

14.00 S.S.F.F. Golf Tournament
17.00 Tennis Tournament
20.30 Informal Reception at the Floral Hall

Tuesday 20 October

10.30 Opening Session
The Conference will be opened by Mr. Eldon Griffiths, M.P., Ministry of Housing and Local Government.
Presentation of "Arnold Marsh" Clean Air Awards
The President, Sir Kenneth Hutchison, C.B.E., F.R.S., will deliver the Presidential Address
Presentation of Prizes to winners of North West Clean Air Competition for Children
13.00 Technical Visits
14.30 Session 2
"The Clean Air Act 1968"
(a) General Experience of the Working of the Act—F. G. Sugden (Chief Public Health Inspector, Tees-side)
(b) The Measurement of Grit and Dust—W. Short (National Industrial Fuel Efficiency Service)

Wednesday 21 October

10.00 Session 3
"The Disposal of Wastes by Incineration"—E. Higginson (Assistant Director, Public Health Engineering, Greater London Council)
14.30 Open Session
"Conservation"
(a) Man and Environment—R. E. Boote (Secretary, European Conservation Year 1970)
(b) Conservation in the North West—Stanley Jeeves (Secretary, (NW) Council for Protection of Rural England)
(c) The Contribution Made by Clean Air—Dr. A. I. Ross (Medical Officer of Health, Bolton)
20.30 Civic Reception, Dance and Cabaret by courtesy of the Mayor and Corporation of Southport at the Floral Hall

Thursday 22 October

10.00 Session 5
“Clean Air—The Balance Sheet”
(a) Industry’s Viewpoint—E. J. Challis (Heavy Organic Chemical Division, Imperial Chemical Industries)
(b) The Domestic Viewpoint—J. Kay (Chief Public Health Inspector, Stretford)
(c) The Impact of a Clean Air Policy—Professor C. R. Lowe (Department of Social & Occupational Medicine, Cardiff)
13.45 Technical Visits
14.30 Session 6
“Clean Air—The Balance Sheet” (continued)
(d) The Viewpoint of the Fuel Industries
  (i) Solid Fuel—M. J. Edwards (Director (Domestic & Industrial) Marketing Dept., National Coal Board)
  (ii) Gas—B. G. H. Clegg (Deputy Director of Marketing, The Gas Council)
  (iii) Electricity—R. H. Phillips (Marketing Adviser, The Electricity Council)
  (iv) Oil—Dr. A. W. Pearce (President, The Institute of Petroleum)
19.30
for 20.00 Conference Dinner and Dance at the Royal Hotel

Friday 23 October

10.00 Session 7
“Pollution from Road Vehicles”
(a) Recent Developments in Pollution Control—A. Thomas and R. Lindsay (Shell Research Ltd.)
(b) The Effects of Emissions—Professor P. J. Lawther and Dr. B. T. Commins (The Medical Research Council)
12.00 Close of Conference

The Conference registration fee this year is 10 guineas for nominated delegates. A special concession fee of four guineas will be charged for individual members.

The scheme for those persons able to attend only one session or the two sessions in the one day, and which has made such a successful impact, will be continued. The special “day registration” fee will be four pounds including papers.

Smoke Control Areas

Programmes and Progress

The following lists contain the names of local authorities in the "Black Areas" with (1) the target date for completion of their Smoke Control Programme, (2) the final acreage when completed, (3) acreage in operation on 1 April, 1970, (4) total number of premises in operation on 1 April, 1970.

The figures have been compiled in most cases directly from information obtained from the local authorities concerned. In the few cases where such information was not received, figures were obtained from the records of the Ministry of Housing and Local Government.

The figures in italics refer to acres and premises in smokeless zones established by local authorities before the Clean Air Acts and in areas where smoke control operates through tenancy agreements.

Bold type indicates completed programmes.

NORTHERN

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.) 1.4.70*	*4* *Premises (In Oper.) 1.4.70*
Tyneside and Wearside				
Gateshead C.B.	—	4,559	950	7,945
Newcastle C.B.	—	11,401	5,094	29,127
South Shields C.B.	1980	4,877	291	3,212
Sunderland C.B.	1980	13,391	1,001	9,053
Tynemouth C.B.	1987	5,000	778	3,549
Jarrow B.	1975	1,500	172	1,301
Wallsend B.	1990	3,544	979	3,855
Blaydon U.D.	—	9,325	291	1,016
Boldon U.D.	1976	7,344	2,367	3,073
Felling U.D.	1976	—	545	3,115
Gosforth U.D.	—	—	—	—
Hebburn U.D.	1974	1,563	1,260	5,258
Longbenton U.D.	—	—	538	760
Newburn U.D.	1980	4,648	692	5,836
Ryton U.D.	—	—	—	—
Whickham U.D.	1977	6,213	952	1,968
Teesside				
Darlington C.B.	—	6,775	151	1,470
Hartlepool C.B.	1976	11,280	2,700	10,307
Teesside C.B.	1974	—	8,295	34,346

YORKSHIRE

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.) 1.4.70*	*4* *Premises (In Oper.) 1.4.70*
West Riding (North)				
Bradford C.B.	1974	25,504	15,614 *1,481*	64,580 *14,284*
Dewsbury C.B.	1975	6,720	3,743	8,025
Halifax C,B.	1977	14,081	2,728	17,042
Huddersfield C.B.	1980	14,147	5,160	22,466
Leeds C.B.	1975	40,613	16,738	65,869

	1 *Target Date*	2 *Final Acreage*	3 *Acreage (In Oper.) 1.4.70*	4 *Premises (In Oper.) 1.4.70*
West Riding (North) (continued)				
Wakefield C.B.	1979	5,801	1,927	4,041
Batley B.	1979	4,461	1,101	5,283
Brighouse B.	1974	7,873	2,948	9,013
Castleford B.	—	—	32	507
Keighley B.	1972	23,600	944	15,604
Morley B.	1977	9,529	6,000	8,200
Ossett B.	**1968**	**3,332**	**3,332**	**5,634**
Pontefract B.	1982	4,865	981	2,042
Pudsey B.	1980	5,323	2,736	5,016
Spenborough B.	1971/3	8,253	3,718	9,042
Aireborough U.D.	—	6,856	5,045	10,657
Baildon U.D.	1971	2,830	2,479	4,241
Bingley U.D.	1971	11,418	6,993	7,528
Denholme U.D.	—	2,536	—	—
Elland U.D.	1974	5,951	3,633	3,022
Featherstone U.D.	—	4,425	—	—
Heckmondwike U.D.	1973	696	423	1,830
Horbury U.D.	1972	1,280	662	2,658
Horsforth U.D.	1973	2,706	1,505	4,389
Knottingley U.D.	1972	2,837	1,042	3,382
Mirfield U.D.	1979	3,394	1,006	2,757
Normanton U.D.	1979	3,061	56	132
Queensbury and Shelf U.D.	1980	2,795	625	1,905
Rothwell U.D.	1974	10,695	3,525	5,765
Shipley U.D.	1971	2,183	1,933	9,388
Sowerby Bridge U.D.	1975	5,763	864	3,492
Stanley U.D.	—	—	464	1,095
West Riding (South)				
Barnsley C.B.	1980	7,817	1,381	4,074
Doncaster C.B.	1975	8,371	4,009	14,025
Rotherham C.B.	1973	8,000	2,446	11,007
Sheffield C.B.	1972	45,363	32,000	25,000
Conisborough U.D.	—	1,593	16	174
Cudworth U.D.	1975	1,746	—	—
Darfield U.D.	—	—	—	—
Darton U.D.	1990	4,718	512	470
Dearne U.D.	1987	3,888	1,181	323
Dodworth U.D.	—	—	—	—
Hoyland Nether U.D.	1972	232	—	—
Mexborough U.D.	1975	1,451	248	390
Rawmarsh U.D.	—	—	—	—
Royston U.D.	1981	—	—	—
Swinton U.D.	—	1,718	813	1,413
Wath-upon-Dearne U.D.	—	2,665	823	1,443
Wombwell U.D.	—	3,850	306	561
Worsborough U.D.	1976	1,660	—	—
Rotherham R.D.	—	—	—	—
East Riding				
Kingston-upon-Hull C.B.	1971	15,106	4848	29,245

NORTH WESTERN

South Lancashire and North-East Cheshire

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.) 1.4.70*	*4* *Premises (In Oper.) 1.4.70*
Bolton C.B.	1980	5,401	2,751	20,765
			86	*1,050*
Bury C.B.	1973	7,434	1,765	7,796
Manchester C.B.	1975	27,255	13,859	80,320
			523	*4,764*
Oldham C.B.	1978	6,392	2,603	10,954
Rochdale C.B.	1975	9,556	5,974	23,649
			67	*337*
Salford C.B.	1972/3	5,202	3,475	28,082
			57	*1,859*
Stockport C.B.	1975	8,440	1,877	14,312
Wigan C.B.	—	5,083	2,148	9,002
Altrincham B.	1976/7	3,519	777	3,333
Ashton-under-Lyne B.	1976	4,146	1,769	7,189
Dukinfield B.	—	1,725	1,330	3,000
Eccles B.	1970	3,417	2,502	7,404
Farnworth B.	1978	1,504	612	2,796
Heywood B.	1972	8,342	3,452	10,209
Hyde B.	1975	4,170	2,211	9,440
Leigh B.	—	6,359	1,552	5,791
Middleton B.	1981	5,170	2,266	8,534
Mossley B.	—	3,661	54	589
Prestwich B.	1974	2,420	1,975	6,311
Radcliffe B.	—	4,915	1,737	3,695
Sale B.	1972	3,629	2,925	17,263
Stalybridge B.	1975	3,190	2,424	4,141
Stretford B.	1973	2,505	2,202	14,503
Swinton and Pendlebury B.	1977	3,363	1,019	5,473
Abram U.D.	—	1,984	—	—
Aspull U.D.	—	1,906	—	—
Atherton U.D.	1973/4	2,265	1,725	4,062
Audenshaw U.D.	1977	1,241	663	1,125
Blackrod U.D.	1973	2,392	—	—
Bredbury and Romily U.D.	—	4,295	522	1,961
Chadderton U.D.	**1969**	**3,013**	**3,013**	**12,163**
Cheadle and Gatley U.D.	**1968**	**5,303**	**5,303**	**21,205**
Crompton U.D.	—	2,865	458	2,470
Denton U.D.	**1969**	**2,589**	**2,589**	**15,391**
Droylsden U.D.	1973	1,245	943	5,895
Failsworth U.D.	1975	1,663	1,122	4,938
Golborne U.D.	1975	5,765	202	394
Hindley U.D.	1979	2,612	225	999
Horwich U.D.	1979	3,254	302	540
Ince-in-Makerfield U.D.	—	—	—	—
Irlam U.D.	1975	4,717	1,043	4,100
Kearsley U.D.	1980	1,720	258	654
Lees U.D.	—	—	—	—
Little Lever U.D.	1975	808	—	—
Royton U.D.	1972	2,149	1,491	4,912

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.) 1.4.70*	*4* *Premises (In Oper.) 1.4.70*
South Lancashire and North-East Cheshire (continued)				
Tottington U.D.	1976	2,544	238	916
Tyldesley U.D.	1980	5,174	870	1,564
Urmston U.D.	1972	3,469	2,334	9,815
Westhoughton U.D.	1980	5,554	325	1,663
Whitefield U.D.	**1968**	**3,386**	**3,386**	**7,800**
Worsley U.D.	1975	7,242	2,097	8,789
Central Lancashire				
Blackburn C.B.	1980	8,080	2,396	10,825
Burnley C.B.	1971	4,695	3,260	21,394
Preston C.B.	1975	6,357	2,319	17,766
			176	*1,918*
Accrington B.	1975/80	4,418	521	3,573
Golne B.	1974	1,200	523	4,033
Darwen B.	1980	—	871	2,143
Nelson B.	1972	1,991	685	6,577
Barrowford U.D.	1974	1,387	578	345
Brierfield U.D.	1975	807	245	855
Church U.D.	—	528	270	1,408
Clayton-le-Moors U.D.	—	1,058	—	—
Fulwood U.D.	1978	3,164	469	855
Great Harwood U.D.	1975/6	2,868	320	600
Oswaldtwistle U.D.	1981	1,500	—	—
Padiham U.D.	1972	976	567	2,362
Rishton U.D.	1986	1,000	64	220
Merseyside				
Birkenhead C.B.	1974	6,716	2,795	12,979
Bootle C.B.	1978	3,330	1,543	8,170
Liverpool C.B.	1980	27,818	14,747	81,600
St. Helens C.B.	1973	7,940	3,387	6,556
Wallasey C.B.	1973/4	5,961	4,983	24,256
Warrington C.B.	1972	4,629	3,129	14,528
Bebington B.	1978	6,000	2,400	12,600
Ellesmere Port B.	1977	4,000	1,946	9,137
Widnes B.	—	5,000	2,600	9,700
Ashton-in-Makerfield U.D.	—	6,265	—	—
Haydock U.D.	—	—	—	—
Huyton-with-Roby U.D.	1985	3,054	1,028	4,283
Kirkby U.D.	1973	2,072	1,847	14,053
Litherland U.D.	—	1,187	348	209
Newton-le-Willows U.D.	1978	2,800	152	1,068
Prescot U.D.	—	—	124	1,141
Runcorn U.D.	1975	8,000	1,220	4,528
MIDLANDS				
Derby, Nottingham and Chesterfield				
Derby C.B.	1979	1,800	5,277	17,853
Nottingham C.B.	1975	18,364	6,850	22,892
			125	*2,000*
Chesterfield B.	1980	8,472	1,400	5,905
Ilkeston B.	1983	3,017	679	2,814
Mansfield B.	1980	7,009	2,229	4,419
Alfreton U.D.	—	4,957	175	—

	1 *Target Date*	*2* *Final Acreage*	*3* *Acreage (In Oper.) 1.4.70*	*4* *Premises (In Oper.) 1.4.70*
Derby, Nottingham and Chesterfield (continued)				
Arnold U.D.	1975/6	4,505	404	1,475
Beeston and Stapleford U.D.	1974	6,468	4,759	14,513
Bolsover U.D.	1973	4,526	86	201
Carlton U.D.	1980	4,018	426	3,250
Dronfield U.D.	1974	3,457	1,688	1,346
Eastwood U.D.	—	—	—	—
Hucknall U.D.	—	4,029	538	1,053
Kirkby-in-Ashfield U.D.	1981	5,831	116	836
Long Eaton U.D.	1980	3,357	37 *57*	448 *650*
Mansfield Woodhouse U.D.	1987	4,834	880	572
Staveley U.D.	1976	6,504	252	838
Sutton-in-Ashfield U.D.	—	10,507	1,839	3,585
West Bridgford U.D.	—	3,045	—	—
Basford R.D.	—	—	—	—
Chesterfield R.D.	1975	25,451	5,973	8,066
North Midlands				
Leicester C.B.	1975	18,144	10,274	50,975
West Midlands				
Birmingham C.B.	1979	51,598	20,554 *203*	125,767 *1,387*
West Midlands (continued)				
Coventry C.B.	1978	20,165	6,464 *30*	2,500 *232*
Dudley C.B.	1980	13,151	6,280	28,338
Walsall C.B.	1980	12,990	2,659	8,706
Warley C.B.	1989	9,471	1,444	10,723
West Bromwich C.B.	1990	11,704	2,340	15,000
Wolverhampton C.B.	1986	17,004	3,615	20,092
Halesowen B.	1971	5,247	2,455	7,191
Nuneaton B.	1978	11,767	3,180	5,339
Solihull B.	1989	13,648	3,002	8,925
Stourbridge B.	—	4,631	1,468	6,288
Sutton Coldfield B.	1979	13,978	1,821	7,016
Aldridge-Brownhills U.D.	1985	13,276	2,429	10,586
Bedworth U.D.	—	—	2,187	3,714
Potteries				
Stoke-on-Trent C.B.	1975	21,209	8,082	18,305
Newcastle-under-Lyme B.	1984	8,861	3,237	10,346
Kidsgrove U.D.	1978/9	4,095	703	1,713
SOUTH WEST				
Bristol				
Bristol C.B.	1983	27,068	5,065	18,105
LONDON				
Greater London Boroughs				
City of London	**1955**	**677**	**677**	**21,700**
Barking	1975	10,778	5,794	44,485
Barnet	1976	22,123	10,596	63,242
Bexley	1975	15,183	9,589	28,492

	1 Target Date	*2 Final Acreage*	*3 Acreage (In Oper.) 1.4.70*	*4 Premises (In Oper.) 1.4.70*
Greater London Boroughs (continued)				
Brent	—	10,928	6,955	67,064
Bromley	1977	37,583	7,327	38,757
Camden	**1968**	**5,364**	**5,364**	**85,862**
Croydon	1978	23,815	5,637	56,652
Ealing	1971	13,708	11,478	85,525
Enfield	1973	20,061	15,812	66,671
Greenwich	1970	11,724	8,703	65,082
Hackney	**1967**	**4,812**	**4,812**	**90,507**
Hammersmith	**1967**	**3,988**	**3,988**	**72,559**
Haringey	**1968**	**7,484**	**7,484**	**94,789**
Harrow	1975	21,555	5,419	34,721
Haveering	1975	29,650	11,659	49,415
Hillingdon	1985	27,250	14,001	38,264
Hounslow	1971	14,469	11,148	48,586
Islington	**1969**	**3,679**	**3,679**	**82,000**
Kensington and Chelsea (Royal)	1971	2,951	2,439	63,043
Kingston-upon-Thames (Royal)	1978	9,281	3,526	21,948
Lambeth	1976	6,738	3,241	57,965
Lewisham	1972	8,579	8,182	84,500
Merton	1975	9,381	5,927	34,883
Newham	1976	8,986	2,029	23,395
Redbridge	1971	13,983	11,645	59,255
Richmond-upon-Thames	1971	13,873	12,264	57,141
Southwark	1976	6,981	4,437	63,981
Sutton	1975	10,338	4,260	31,455
Tower Hamlets	**1968**	**4,994**	**4,994**	**78,702**
Waltham Forest	1979	9,804	6,567	59,198
Wandsworth	1974	8,872	5,892	59,712
Westminster (City)	1970	5,334	5,097	127,359
Outer London				
Dartford	1976	4,292	1,270	8,379

Local Authorities Outside the Black Areas

Local Authorities outside the Black Areas who have Smoke Control Areas in operation, with total acreages and premises to 1.4.70

	Acreage	*Premises*		*Acreage*	*Premises*
Aylesbury B.	275	1,894	Crewe B.	937	5,576
Basildon U.D.	4,128	19,207	Darlington R.D.	556	4,659
Bedford B.	2,812	9,296	Easthampstead R.D.	180	1,086
Belper R.D.	217	27	Elstree R.D.	500	2,877
Blaby R.D.	870	1,483	Exeter C.B.	5,300	10,667
Blackburn R.D.	260	413	Flaxton R.D.	288	—
Brentwood U.D.	219	2,799	Gillingham B.	4,053	8,926
Burton-on-Trent C.B.	180	1,470	Glanford Brigg R.D.	1,526	1,860
Cambridge B.	23	279	Glossop B.	711	829
Canterbury C.B.	167	1	Grantham B.	1,270	3,845
Chatham B.	2,805	6,030	Gravesend B.	686	1,381
Cheltenham B.	850	2,000	Hale U.D.	44	889
Cheshunt U.D.	975	6,930	**Harlow U.D.**	**5,889**	**17,310**
Corby U.D.	1,136	6,608			
Crawley U.D.	4,357	14,732	Hazel Grove and Bramhall U.D.	1,825	4,895

Heanor U.D.	63	46
Hemel Hempstead B.	2,879	—
High Wycombe B. ...	2,753	10,407
King's Lynn B. ...	198	805
Kingswood U.D. ...	12	131
Lancaster B.	3,389	5,114
Leamington Spa B. ...	529	4,313
Leek U.D.	95	330
Letchworth U.D. ...	1,103	3,524
Lincoln C.B. ...	1,491	2,165
Luton C.B.	3,113	15,306
Marple U.D.	419	1,600
Meriden R.D. ...	2,284	14,350
New Windsor R.B. ...	415	1,082
Northfleet U.D. ...	377	2.277
Norwich C.B. ...	104	1,002
Old Fletton U.D. ...	149	1,039
Oxford C.B.	2,036	7,795
Peterborough B. ...	294	—
Potters Bar U.D. ...	901	2,911
Ramsbottom U.D. ...	673	1,134
Reading C.B. ...	1,709	8,026
Ripley U.D.	90	271
Rochester B. ...	2,693	9,500
Rugby B.	2,582	6,104
Runcorn R.D. ...	45	485
Saddleworth U.D. ...	81	379
Scunthorpe B. ...	2,995	9,644
Seaton Valley U.D. ...	1,960	2,163
Seisdon R.D. ...	1,052	145
Shrewsbury B. ...	379	582
Skelmersdale U.D. ...	3,233	2,476
Skipton U.D.	1,317	2,647
Slough B.	2,953	13,766
Southampton C.B. ...	1,648	7,800
South East Derbyshire R.D. ...	11	122
Southport C.B. ...	67	128
Staines U.D.	6,751	13,120
Stanley (Co. Durham) U.D.	1,143	936
Swadlincote U.D. ...	553	97
Tamworth B. ...	1,114	1,820
Thurrock U.D. ...	4,636	11,765
Todmorden B. ...	604	4,577
Waltham Holy Cross U.D.	299	793
Warwick B.	147	970
Watford B.	1,854	5,469
Wellington U.D. ...	197	974
Wetherby R.D. ...	100	720
Whiston R.D. ...	459	5,136
Whitley Bay B. ...	1,730	4,458
Wilmslow U.D. ...	293	11.060
Winsford U.D. ...	608	4,417
Wortley R.D. ...	1,076	3,758

WALES

Total Acreage and Premises in Operation at 1.4.70

	Acreage	*Premises*
Connah's Quay U.D.	53	—
Mold U.D. (Nos. 1 & 2) ...	137	663
Newport C.B. ...	43	651
Wrexham U.D. (Nos. 1 & 2) ...	863	3,941
Pontypridd	8,141	12,717

(By arrangement only low volatile coal to be sold in the area)

SCOTLAND

Total Acreage and Premises in Operation at 1.4.70

	Acreage	*Premises*
Alloa	272	1,131
Barrhead	619	3,832
Bearsden	418	1,597
Bishopbriggs	572	1,394
Clackmannan County	370	1.694
Clydebank	1,454	7,143
Coatbridge	4,032	15,820
Denny and Dunipace	113	276
Dumbarton Burgh ...	1,181	5,100
Dundee	5,188	29,272
East Kilbride ...	**6,003**	**18,893**
Edinburgh	7,335	24,297
Falkirk	3,188	6,450
Fife County	852	3,242
Galashiels	953	2,418
Glasgow	22,509	157,653
Grangemouth ...	674	4.216
Hamilton	557	3,749
Kilmarnock	**77**	**298**
Lanark County ...	1,328	7,314
Midlothian County ...	1,070	2,932
Milngavie	250	35
Motherwell	541	11,005
Paisley	4,314	19,581
Port Glasgow ...	815	3,461
Renfrew Burgh ...	1,982	4,555
Rutherglen	639	4,466
Stirling County ...	4,162	8,656
West Lothian ...	2,384	11

NORTHERN IRELAND

Total Acreage and Premises in Operation at 1.4.70

	Acreage	*Premises*
Antrim R.D.	72	772
Belfast C.B. No. 1	514	3,226
Castlereagh R.D. (Nos. 1 & 2)	1,653	4,220
Craigavon U.D.	32	359
Hillsborough R.D. (No. 1)	338	463
Holywood U.D. (Nos. 1 & 2)	78	14
Lurgan B.C. (No. 1)	209	—
Newtownabbey U.D. (Nos. 1 & 2)	248	1
Portadown B.C. (Nos. 1 & 2)	85	613

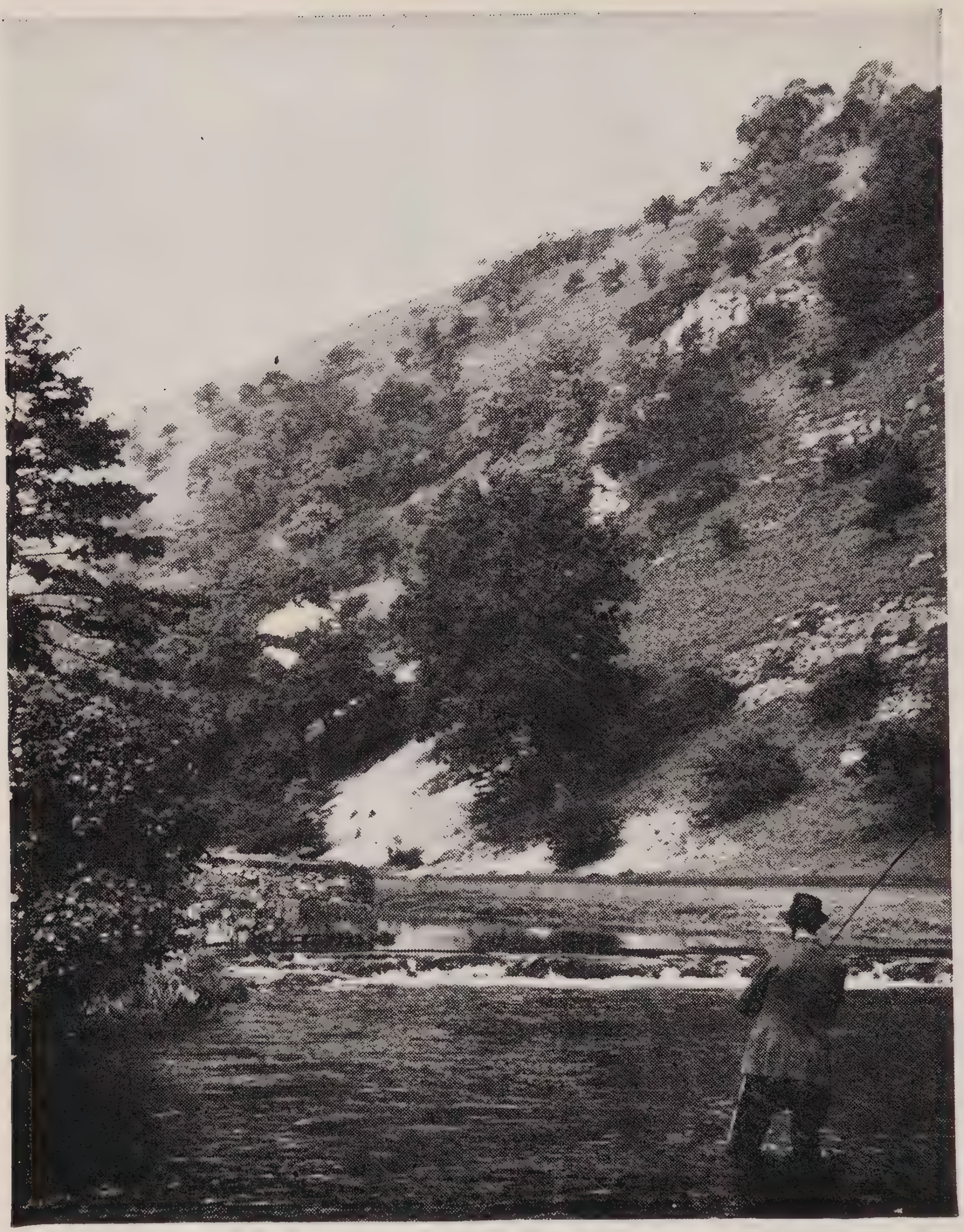
Smoke Control Position in Regions of England

at 31st March, 1970

(*Figures Supplied by Ministry of Housing and Local Government*)

(1) *Region*	(2) *No. of black areas acres covered by smoke control orders confirmed or awaiting decision*	(3) *Percentage* of total black area acreage in region so covered*	(4) *No. of black area premises covered by smoke control orders confirmed or awaiting decision*	(5) *Percentage* of total black area premises in the region*
Northern	37,229	29·7	153,246	27·7
Yorkshire and Humberside	178,468	47·4	590,477	50·6
East Midlands	59,985	22·4	183,407	35·8
Greater London	236,140	72·2	2,079,518	78·8
North Western	187,523	46·7	772,478	45·4
West Midlands	82,076	33·0	370,936	35·3
South Western	7,505	28·5	28,697	19·3
Total (black areas)	788,926	44·5	4,178,757	53·7
Outside black areas (all parts)	141,365	—	454,698	—
GRAND TOTALS	930,291	—	4,633,457	—

*The percentage shown in columns (3) and (5) above are percentages of the *total* acreage and of the total number of premises in the black areas concerned. In practice it may not always be necessary for the whole of the black area authority's district to be covered by smoke control orders (e.g. there may be some areas of open country).



Unhurried calm. Unspoiled beauty.
These are two of Derbyshire's greatest gifts
to everyone in Britain today.

Another is the
glorious warmth
of an open fire
with 'Coalite'
smokeless coal.

'COALITE'

THE MODERN SMOKELESS COAL

The Clean Air Case

A Synopsis for the Guidance of Speakers, Writers, Teachers, etc.

1. Historical Background. Growth of the air pollution problem and efforts to abate it, from 1273 to the present day. (*See History table.*)

2. Nature, Sources and Causes, Smoke: Due to incomplete combustion; consists of fine carbonaceous particles and tarry droplets. (For quantities produced, *see Table.*)

Gases: Sulphur dioxide the most harmful, especially when in association with smoke particles. Also carbon monoxide, and noxious gases and fumes from chemical processes. See the Society's Report on *Sulphur Dioxide as an Air Pollutant.*

Grit and dust: Mainly from industrial sources, e.g., pulverized coal and high-draught furnaces.

3. Extent and Behaviour of Pollution. Measurement of floating and deposited impurities, sulphur dioxide, and of light values. The Investigation under the Warren Spring Laboratory (*q.v.*).

4. Fog. Natural and smoke fogs, their formation and characteristics. The London, 1952, 1962, and other lethal smogs.

5. Effects. *Health:* Effects on respiratory system. Effects due to obstruction of natural light. Possible relationship with lung cancer. Psychological and social consequences of life in smoke-ridden environment. Effects of smog are the result of infrequent high concentration of pollution, whereas the insidious action of "normal" pollution takes place continuously.

Plant Life: Principal factors injurious to vegetation are: loss of sunlight, blocking of stomata by deposits, direct attack by chemicals, acidification of soil. Indirect effect on grazing animals through deterioration of herbage, or of poisoning in the case of fluoride pollution.

Materials: Corrosion or erosion of metals, stone, fabrics, leather, etc.

Visibility: Loss of visibility due to smoke haze and smog affecting air and surface transport.

Costs: See information on page 67

6. Prevention. *Industrial Smoke:* Calls for correct equipment, maintenance and operation of plant. Value of mechanical stoking. Uses of oil, gas, electricity and smokeless solid fuel. Importance of training and certification of stokers. Instrumentation, smoke alarms, etc. Need for all-round fuel efficiency. *Dust and grit:* Use of arrestors of appropriate types: cyclones, wet washing, electrostatic precipitators. *Sulphur:* removal by coal washing, flue gas-washing and other possible means. Importance of high chimneys and emission velocity.

Domestic: By use of smokeless fuels—gas, electricity, oil or solid. *See article describing the types of solid smokeless fuel.* Need for efficient appliances. Central and district heating, whole-house warming, off-peak electrical methods, etc. Smoke control areas, purpose and national programme.

Railways and Roads: Use of diesels and electricity for the former. Need for efficient combustion and good maintenance in road vehicles, possible development of catalytic afterburners and other devices.

7. Policy, Law, etc. The present law—Clean Air Acts, 1956 and 1968, Public Health Act, 1936, local Acts, Road Traffic Act, 1930, Alkali, etc., Works Regulation Act, 1906, and Orders, etc. The Beaver Report and its proposals. Responsibilities of local authorities and central Government. Smokeless zones and smoke control areas. Work of the Warren Spring Laboratory, Alkali Inspectorate and other organizations. Educational and publicity work of the National Society for Clean Air.

(See also the NSCA booklet "Notes on the background to Clean Air", 5s.

The History of Air Pollution in Great Britain

A Chronological Table

1273	Use of coal prohibited in London as being "prejudicial to health".
1306	Royal Proclamation prohibiting artificers from using sea-coal in their furnaces. Record of the execution of one offender.
1307	Commission of Inquiry appointed to "inquire of all such who burnt sea-coal in the city or parts adjoining, and to punish them for the first offence with great fines and ransoms, and upon the second offence to demolish their furnaces".
1578	Queen Elizabeth I "findeth herselfe greately greved and anoyed with the taste and smoke of the sea-cooles".
1648	Petition of Londoners to Parliament to prohibit the importation of coal from Newcastle on account of the injury they experienced.
1661	John Evelyn submitted his "Fumifugium, or the Smoake of London Dissipated", to Charles II.
1819	Committee appointed by Parliament to inquire how far persons using steam engines and furnaces could erect them in a manner less prejudicial to public health and comfort.
1843	A Select Committee recommended the introduction of a Bill dealing with nuisances from furnaces and steam engines.
1845	Another Select Committee reported that it was not desirable to extend the provisions of an Act beyond furnaces used for steam generation.
1847	The Town Improvement Clauses Act contained a section dealing with factory smoke.
1853-6	Smoke Abatement Acts relating to the Metropolitan area.
1866	The Sanitary Act empowered sanitary authorities to take action in cases of smoke nuisances.
1875	The Public Health Act containing a smoke abatement section on which legislation to the present day has been based.
1881	Smoke Abatement Exhibition at South Kensington organized by the Public Health and Kyrle Societies.
1882	Formation of the National Smoke Abatement Institution.
1891	The Public Health (London) Act.
1899	Formation of the Coal Smoke Abatement Society, led by Sir William Richmond, R.A., and Dr. H. A. Des Vœux (concerned mainly with London).
1909	Sheffield Smoke Abatement Exhibition, at which was set up the Smoke Abatement League of Great Britain (mainly for the provinces and centred later in Manchester and Glasgow).
1912	International Smoke Abatement Exhibition in London, organized by the Coal Smoke Abatement Society, leading to the formation of a Committee for the Investigation of Atmospheric Pollution.
1913	Smoke Abatement Bill introduced in the House of Commons by A. G. C. Harvey, M.P.
1914	Smoke Abatement Bill introduced in the House of Lords by Lord Newton. Withdrawn on the appointment of a Departmental Committee to investigate the problem.
1920	Committee re-formed after the war with Lord Newton as Chairman.
1921	Publication of the Final Report of the Newton Committee.
1926	Public Health (Smoke Abatement) Act by which the 1875 and 1891 Acts were amended and extended.
1927	Establishment of first regional committees of local authorities.
1929	Amalgamation of the Coal Smoke Abatement Society and Smoke Abatement League of Great Britain to form the National Smoke Abatement Society. First publication of a journal (now *Smokeless Air*) devoted to air pollution.

1936 Public Health Act, in which were included the provisions of the Smoke Abatement Act of 1926.

1946 Simon Report on Domestic Fuel Policy, recommending, *inter alia*, measures for domestic smoke prevention.

1946 First smokeless zone and prior approval legislation (Manchester Corporation Act).

1951 First smokeless zone established (in Coventry).

1952 Ridley Report on "Policy for the Use of Fuel and Power Resources", recommending, *inter alia*, measures for smoke prevention.

1952 London smog disaster, the most serious for many years, with a death roll of 4,000 (*q.v.*).

1953 Beaver Committee on Air Pollution set up by the Government and published an Interim Report.

1954 Final Report of the Beaver Committee.

1954 A Clean Air Bill introduced by Gerald Nabarro, M.P., and withdrawn (4 February 1955) on Government undertaking to introduce their own Bill.

1955 Whole of City of London declared a smokeless zone.

1956 Clean Air Act.

1958 National Smoke Abatement Society became incorporated under new name of National Society for Clean Air.

1959 International Diamond Jubilee Clean Air Conference and Exhibition (N.S.C.A.), London.

1962 Smog episode in London and other cities. Estimated death roll of 750 in Greater London.

1962 Holborn M.B. first local authority in country to reach its final target under Clean Air Act.

1964 Amendments to Clean Air Act in Housing Act, 1964, modifying smoke control area policy. Clean Air Act (Northern Ireland).

1966 First Congress of the new International Union of Air Pollution Prevention Associations (in London).

1968 Clean Air Act passed.

1969 Clean Air Act brought into operation.

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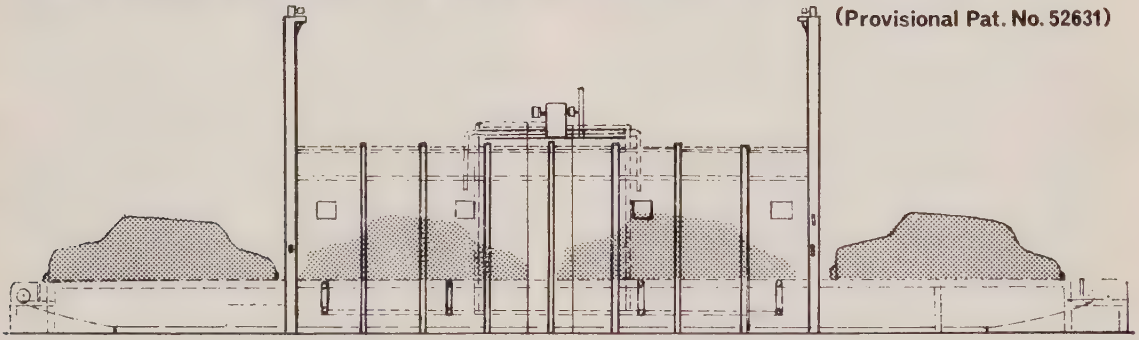

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DIRECTORY OF ORGANIZATIONS

with Air Pollution Interests

Great Britain

Alkali Inspectorate:

Chief Inspector, Ministry of Housing and Local Government, Whitehall, London, S.W.1 (01-930 4300 ext. 76).

Deputy Chief Inspectors, Ministry of Housing and Local Government, Whitehall, London, S.W.1 (01-930 4300 Ext. 54 and 61).

Chief Inspector for Northern Ireland, M. D. Hinchliff, Government of Northern Ireland, Ministry of Health and Social Services, Lindsay House, Callender Street, Belfast BT1 5DU (Belfast 42751).

Chief Inspector for Scotland, Scottish Development Department, 21 Hill Street, Edinburgh, EH2 3JY (031-226 5208).

Architects and Surveyors, Incorporated Association of, 29 Belgrave Square, London, S.W.1 (01-235 3755/7).

Architects, Royal Institute of British, 66 Portland Place, London, W1N 4AD (01-580 5533).

Arts, Royal Society of, 6-8 John Adam Street, London, W.C.2 (01-839 2366).

BCURA Industrial Laboratories, Randalls Road, Leatherhead, Surrey (Leatherhead 4411).

BISRA—The Corporate Laboratories of the British Steel Corporation, 24 Buckingham Gate, London, S.W.1 (01-828 7931).

British Independent Steel Producers Association, 5 Cromwell Road, S.W.7 (01-581 0231).

British Industrial Measuring and Control Apparatus Manufacturers' Association, 23/24 Margaret Street, London, W1N 7LB (01-580 9336).

British Internal Combustion Engine Research Institute Ltd., 111/112 Buckingham Avenue, Slough, Bucks (Slough 27371).

British Ironfounders' Association, 30 St. James's Square, London, S.W.1 (01-930 6866 and 6436), and Fleming House, Renfrew Street, Glasgow, C.3 (041-332 0826-7).

British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1 (01-387 4499).

British Oil & Gas Firing Equipment Manufacturers' Association, Old Boundary House, London Road, Sunningdale, Berks (Ascot 20294).

British Standards Institution, British Standards House, 2 Park Street, London, W1Y 4AA (01-629 9000).

British Steel Corporation, P.O. Box No. 403, 33 Grosvenor Place, London, S.W.1 (01-235 1212).

Building Centre, The, 26 Store Street, London, WC1E 7BT (01-636 5400).

Cast Iron Research Association, British, Alvechurch, Birmingham (Redditch 66414).

Central Electricity Generating Board, Sudbury House, 15 Newgate Street, London, E.C.1 (01-248 1202).

Centre for Environmental Studies, 5 Cambridge Terrace, Regent's Park, London, N.W.1 (01-486 3956).

Chemical Engineers, Institution of, 16 Belgrave Square, London, S.W.1 (01-235 3647).

Chemistry, Royal Institute of, 30 Russell Square, London, W.C.1 (01-580 3482).

City and Guilds of London Institute, 76 Portland Place, London, W1N 4AA (01-580 3050).

Civic Trust, 18 Carlton House Terrace, London, S.W.1 (01-930 0914).

Civil Engineers, Institution of, Great George Street, London, S.W.1 (01-839 3611).

Clean Air Council, Ministry of Housing and Local Government, Whitehall, London, S.W.1 (01-930 4300 Ext. 345).

Clean Air Council for Scotland, Scottish Development Department, 21 Hill Street, Edinburgh, EH2 3JY (031-226 5208).

Clean Air, National Society for:

Central Offices: 134/136 North Street, Brighton.

East Midlands Division: Health Department, Town Hall, Chesterfield (0246 77232).

North-East Division: Health and Social Services Department, Civic Centre Barras Bridge, Newcastle upon Tyne 1 (0632 28520).

North-West Division: Health Centre, Salford, Lancs (061-736 5891 Ext. 263).

Northern Ireland Division: Public Health Department, 414 Ormeau Road, Belfast 7 (0232 642905).

Scottish Division: 78 Cochcrane Street, Glasgow (041-221 9600 Ext. 2538).

South East Division: Public Health Department, 8 Easton Street, High Wycombe, Bucks (04-94 26100).

South Wales and Monmouthshire Division: 9 Lodge Drive, Baglan, Port Talbot, Glam (0639 62244 Ext. 45).

South West Division: St. Clement's House, Marsh Street, Bristol 1 (0272 26241).

West Midlands Division: Public Health Inspector's Office, Municipal Buildings, Cradley Heath, Warley, Worcs (0384 66891).

Yorkshire Division: Public Health Department, 12 Market Buildings, Vicar Lane, Leeds 1 (0532 30211 Ext. 29).

Coal Board, National, Hobart House, Grosvenor Place, London, S.W.1 (01-235 2020).

Coal Utilisation Council, 19 Rochester Row, London, S.W.1 (01-834 2339).

Coke Distributors' Associations, National Federation of, Terminal House, 52 Grosvenor Gardens, London, S.W.1 (01-730 6120).

Area Offices:

London and Counties C.D.A.: Terminal House, 52 Grosvenor Gardens, London, S.W.1 (01-730 6129).

Midland Counties C.D.A.: Fuel House, 12 George Road, Edgbaston, Birmingham 15 (021-454 8225).

Northern C.D.A.: 54/55 Bondgate, Darlington, Co. Durham (0325 2832).

North Eastern C.D.A.: West Bar Chambers, 38 Boar Lane, Leeds 1 (0532 33361).

Wales C.D.A.: 4 Dock Chambers, Bute Street, Cardiff (0222 29649).

Lancashire and District C.D.A.: 49 Bolton Road, Farnworth, Bolton, BL4 7JN.

Coke Oven Managers' Association, Waveney House, Adwick, Road, Mexborough, Yorkshire.

Coke Research Association, British, Chesterfield, Derbys (Chesterfield 76821).

Combustion Engineering Association, Trident House, Station Road, Hayes, Middlesex (01-573 1393 and 2967).

Confederation of British Industry, 21 Tothill Street, London, S.W.1 (01-930 6711).

Council for the Protection of Rural Wales (Cymdeithas Diogelu Harddwych Cymru), Meifod, Montgomeryshire (Meifod 383).

County Borough's Association, Guildhall, Kingston-upon-Hull (Kingston-upon-Hull 36880).

County Councils Association, Eaton House, 66A Eaton Square, London, S.W.1 (01-235 5173).

County Councils in Scotland, Association of, 3 Forres Street, Edinburgh (031-225 1626/7).

Derbyshire Clean Air Joint Consultative Committee, Town Clerk's Office, Town Hall, Chesterfield (0246 77232).

Domestic Heating Society, Norwich House, 58/62 High Street, Epsom, Surrey.

Domestic Solid Fuel Appliances Approval Scheme, 19 Rochester Row, London, S.W.1 (01-834 2339).

Electrical Association for Women, 25 Foubert's Place, London, W1U 2AL (01-437 5213).

Electrical Engineers, Institute of, Savoy Place, WC2R 0BL (01-240 1871).

Electrical Research Association: Offices, Library and Laboratories, Cleeve Road, Leatherhead, Surrey (537 4151).

Electricity Council, 30 Millbank, London, S.W.1 01-834 2333).

Esso Petroleum Co. Ltd., Victoria Street, London, S.W.1 (01-834 6677).

Forest Products Research Laboratory (Ministry of Technology), Princes Risborough, Nr. Aylesbury, Bucks (084-44 3101).

Fuel, Institute of, 18 Devonshire Street, London, W1N 2AU (01-580 7124).

Fuel Technology, College of, 90 Talbot Road, Highgate, London, N.6 (01-340 6972).

Gas Council, The, 59 Bryanston Street, Marble Arch, London, W1A 2AZ (01-723 7030).

Gas Engineers, Institution of, 17 Grosvenor Crescent, London, S.W.1 (01-245 9811).

Gas Industries, Society of British, 17 Grosvenor Crescent, London, S.W.1 (01-245 9811).

Health and Social Security, Department of, Alexander Fleming House, Elephant and Castle, London, S.E.1 (01-407 5522).

Health Education Council Ltd., Lynton House, 7-12 Tavistock Square, London, W.C.1 (01-387 0581).

Health, Royal Society of, 90 Buckingham Palace Road, London, S.W.1 (01-730 5134).

Heating and Ventilating Engineers, Institution of, 49 Cadogan Square, London, S.W.1 (01-235 7671/2/3).

Hospital Engineering, Institute of, 20 Landport Terrace, Southsea, Hampshire (0705 23186).

Housing and Local Government, Ministry of, Whitehall, London, S.W.1 (01-930 4300). (See also Alkali Inspectorate).

Housing Centre Trust, 13 Suffolk Street, London, S.W.1 (01-930 2881).

Institute for Conservation of Historic & Artistic Works, International, 176 Od Brompton Road, London, S.W.5 (01-373 5975).

Institute of Housing Managers, Victoria House, Southampton Row, London, W.C.1 (01-242 3267/8).

Institution on Corrosion Technology, The, 14 Belgrave Square, London, S.W.1 (01-245 9189).

Iron Council, Joint, 14 Pall Mall, London, S.W.1 (01-930 7171).

Ironfoundry Association, Council of, 14 Pall Mall, London, S.W.1 (01-930 7171).

London Boroughs Association, Westminster City Hall, Victoria Street, London, S.W.1 (01-828 8070).

Low Temperature Coal Distillers' Association of Great Britain Ltd., P.O. Box No. 21, Chesterfield, Derbyshire (0246 82 2281/9).

Manchester and District Regional Clean Air Council, Town Hall, Manchester M60 2JS (061-236 3377 Ext. 2551).

Mechanical Engineers, Institution of, 1 Birdcage Walk, London, S.W.1 (01-930 7476).

Medical Officers of Health, The Society of, Tavistock House South, Tavistock Square, London, W.C.1 (01-387 3923).

Medical Research Council, Air Pollution Unit, St. Bartholomew's Hospital Medical College, Charterhouse Square, London, E.C.1 (01-253 1537).

Meteorological Office, London Road, Bracknell, Berkshire (0344 20242).

Meteorological Office, Weather Centres:
Forecasts, London: 01-836 4311.
Glasgow: 041-248 3451.
Manchester: 061-832 6701.
Newcastle: 0632 26453.
Southampton: 0703 28844.
Nottingham (Watnall): 0602 55155.

Meteorological Society, Royal, 49 Cromwell Road, London, S.W.7 (01-589 0730).

Motor Industry Research Association, The, Lindley, Nr. Nuneaton, Warwickshire (Nuneaton 323664).

Municipal Corporations, Association of, 36 Old Queen Street, Westminster, London, S.W.1 (01-930 9861).

Municipal Engineers, Institution of, 25 Eccleston Square, London, S.W.1 (01-834 5082/3).

National Housing and Town Planning Council Incorporated, 1 Green Street, London, W.1 (01-629 7107/8).

National Industrial Fuel Efficiency Service, Abford House, 15 Wilton Road, London, S.W.1 (01-828 8241).

Area Offices:

North Eastern: St. Paul's House, 20/22 St. Paul's Street, Leeds, LS1 2QE (0532 20046). 44A Great North Road, Newcastle upon Tyne, NE2 4HA (0632 813776 and 814098).

London and South Eastern: 54/58 Bartholomew Close, London, E.C.1 (01-606 5906).

Eastern: 5 St. Andrew's Street, Cambridge, CB2 3EY (0223 56271).

Wales and South Western: Baltic House, Mountstuart Square, Cardiff, CF1 6DH (0222 33825).

West Midlands: 26 Calthorpe Road, Edgbaston, Birmingham, 15 (021-454 4471).

East Midlands: Wellington House, 190 Derby Road, Nottingham, NG7 1NR (0602 44753).

North Western: 89 Oxford Street, Manchester, M1 6ES (061-236 9228).

Scotland: 6 Park Terrace, Glasgow, C.3 (041-332 2453). 49 Meadowside, Dundee, DD1 1EQ (0382 22179).

Northern Ireland: 412 Antrim Road, Belfast, BT15 5GA (0232 76246).

Central Repair Depot: Croydon House, Croydon Street, Leeds, LS11 9RT (0532 35978).

National Trust for Places of Historical Interest or Natural Beauty, 42 Queen Anne's Gate, London, S.W.1 (01-930 0211).

Parliamentary and Scientific Committee, 7 Buckingham Gate, London, S.W.1 (834 2608).

Petroleum, Institute of, Atmospheric Pollution Committee, 61 New Cavendish Street, London, W.1 (01-636 1004).

Power, Ministry of, see "Technology".

Protection of Rural England, Council for the, 4 Hobart Place, London, S.W.1 (01-235 4771).

Protection of Ancient Buildings, Society for the, 55 Great Ormond Street, London, WC1N 3JA (01-405 2646).

Public Health and Hygiene, Royal Institute of 28 Portland Place, London, W1N 4DE (01-580 2731/2).

Public Health Engineers, Institution of, 32 Eccleston Square, London, S.W.1 (01-834 3017).

Public Health Inspectors, Association of, 19 Grosvenor Place, London, S.W.1 (01-235 5158/9).

Road Transport Engineers, The Institute of, 1 Cromwell Place, Kensington, London, S.W.7 (01-589 3744).

Royal Institution of Great Britain, 21 Albemarle Street, London, W1X 4BS (01-493 0669 and 5716).

Rural District Council's Association, 147 Victoria Street, Westminster, London, S.W.1 (01-828 7425/8).

Sanitary Association of Scotland, The Royal, 113 West Regent Street, Glasgow (041-248 7158).

Scientific Instrument Manufacturers' Assoc. of G.B., 20 Peel Street, London, W.8 (01-727 2614).

Scientific Instrument Research Assoc., South Hill, Chislehurst, Kent (01-467 5555).

Scottish Counties of Cities Association, City Chambers, Edinburgh (031-225 2424).

Scottish Development Department, 21 Hill Street, Edinburgh, EH2 3JY (031-226 5208).

Sheffield and District Clean Air Committee, Town Hall, Sheffield (0742 26444).

Shell-Mex & B.P. Ltd., Shell-Mex House, Strand, London, W.C.2 (01-836 1234).

Social Service, National Council of, 26 Bedford Square, London, W.C.1 (01-636 4066).

Solid Smokeless Fuels Federation, York House, Empire Way, Wembley, Middlesex (01-902 5405).

Standing Conference of Co-operating Bodies, Warren Spring Laboratory (Ministry of Technology), Gunnels Wood Road, Stevenage, Herts (0438 3388).

Stationery Office, Her Majesty's, Atlantic House, Holborn Viaduct, London, E.C.1 (headquarters) (01-248 9876), and at Sovereign House, St. Georges Street, Norwich, NOR 76A (Norwich 22211).

Steel Castings Research and Trade Association, East Bank Road, Sheffield, S2 3PT (0742 28647).

Structural Insulation Association, 32 Queen Anne Street, London, W1M 0DP (01-580 7616).

Technology, Ministry of, Millbank Tower, Millbank, London, S.W.1 (01-834 2255). See also Forest Products Research Laboratory and Warren Spring Laboratory.

Tees-side Clean Air Committee, Town Clerk's Office, Municipal Buildings, Middlesbrough, Tees-side (0642 45984).

Town and Country Planning Association, 28 King Street, Coventry Garden, London, WC2E 8JG (01-836 5006/7).

Town Planning Institute, 26 Portland Place,

Urban District Council's Association, Palace London, W1N 4BE (01-636 9107/8/9). Chambers, Bridge Street, London, S.W.1 (01-930 4868).

Warren Spring Laboratory (Ministry of Technology), Gunnels Wood Road, Stevenage, Herts (0438 3388).

Warwickshire Clean Air Council, Council House, Coventry (Coventry 25555).

West Bromwich Clean Air Council, C. R. Cresswell, Esq., Secretary, West Bromwich Corporation, P.O. Box No. 40, Town Hall, Lombard Street West, West Bromwich.

West Lancashire and Cheshire Regional Smoke Abatement Committee, c/o Health Department, Hatton Garden, Liverpool, 3 (051-227 3911 Ext. 180).

West Riding Clean Air Advisory Council, Public Health Department, 25 East Parade, Leeds, 1 (0532 30661).

Women of Great Britain, National Council of 36 Lower Sloane Street, London, S.W.1 (01-730 0619).

Women's Advisory Council on Solid Fuel, The, 18 South Molton Street, London. W1Y 2LY (01-629 5358).

Women's Gas Federation & Young Homemakers, Gaywood House, 29 Great Peter Street, London, S.W.1 (01-222 5351).

Overseas

Argentine

Asociación Argentina Contra la Contaminación del Aire, Juncal 1699, Buenos Aires.

Australia

Clean Air Society of Australasia, P.O. Box 31, George Street North P.O., Sydney, New South Wales.

Dept. of Public Health, Box 65, Rundle Street, Adelaide, South Australia.

Dept. of Health, George Street, Brisbane, Queensland.

Dept. of Health Services, 24 Campbell Street, Hobart, Tasmania.

Dept. of Health, 316 Queen Street, Melbourne, Victoria.

Dept. of Public Health, 57 Murray Street, Perth, Western Australia.

Dept. of Public Health, N.S.W. Air Pollution Control Branch, 86-88 George Street, Sydney, N.S.W.

Austria

Austrian Society of Industrial Medicine, Kinderspitalgasse 15, Vienna, 9.

Belgium

Centre Scientifique et Technique de la Construction 5 rue de la Violette, Brussels, 1.

Conseil National Contre la Pollution de l'Air, 6, Place de Martyrs, Brussels.

Society of Health and Social Medicine. Secretary: Professor Graffar, Professor of Social Medicine Liberal University of Brussels.

Cebedair, 2, rue Armand Stévart, Liége.

International Iron and Steel Institute, 5, Place du Champ de Mars, Brussels 5.

Brazil

Associação Brasileira de Prevenção à Poluição do Ar.
Rua Catumb, 318-6° ander, São Paulo, 2.P.7.

Canada

British Columbia Clean Air Association, 2907 West 42nd Avenue, Vancouver 13, B.C.

Dept. of National Health and Welfare. Environmental Assessment Unit Occupational Health Division, 455 Spencer Street, Ottawa 4, Ontario.

Czechoslovakia

Czech Polytechnic University of Prague, Faculty of Mechanical Engineering, Department of Air Engineering, Praha 6, Technická 1902.

Czechoslovak Academy of Sciences, Institut for Physics of the Atmosphere, Praha 4, Spořilov, Boční 11.

Czechoslovak Institut of Physical Chemistry, Department of Physical Chemistry of Aerosols, Praha 2, Máchova 7.

Institut of Hygiene, Praha 10, Srobarova 48.

Power Research Institut, Praha 7, Partizánská 7a.

Research Institut of Air Engineering, Praha 10, Malešice.

Denmark
Cinderkoks Information, Raadhuspladsen 59, Copenhagen 5.
Densk Kedelforening Vesterbrogade I.A., Copenhagen.
National Health Service of Denmark, 1 St. Kongensgade, Copenhagen K.

Finland
Finnish Council for Air Conservation and Noise Abatement, Haartmaninkatu 1, Helsinki 25.
Ministry of Internal Affairs, Aleksanterinkatu 3D, Helsinki.

France
Association pour la Prévention de la Pollution Atmosphérique. M. Yvan Queret, 62 rue de Courcelles, Paris 8.
Association Technique de l'Industrie du Gaz en France, 62, rue de Courcelles, Paris, 8.
Centre d'Information pour le Développement de Conditionnement d'Air, de la Ventilation, du Filtrage de l'Air et du Dépoussierage, 38 rue Copernic, Paris 16.
Centre Interprofessionnel Technique d' Études de la Pollution Atmosphérique (C.I.T.E.P.A.), 28 rue de la Source, 75 - Paris (XVI^{e}).
Charbonnages de France, 9 Avenue Percier, Paris 8.
Comité de coordination pour la prévention de la pollution atmosphérique which comprises the following: 21 rue Murillo—75—Paris (8ème). Président: M. le Professeur Moureu.
Association pour la Prévention de la Pollution Atmosphérique (A.P.P.A.), 62 rue de Courcelles—75—Paris (8ème).
Comité d'Action Technique contre la Pollution Atmosphérique (C.A.T.P.A.), 28 rue de la Source—75—Paris (16ème).
Centre Interprofessionnel Technique d'Etudes de la Pollution Atmospherique (C.I.T.E.P.A.). 28 rue de la Source—75—Paris (16ème).
Comité National d'Action pour l'Assainissement de l'Atmosphère (C.A.P.A.), 54 avenue Marceau—75—Paris (8ème).
Centre de Recherches sur la Pollution Atmosphérique (INSERM-C.R.P.A.) 3, rue Léon Bonnat—Paris (16ème), 44, Chemin de Ronde—78—IE Vestinet.
Centre National de la Recherche Scientifique (C.N.R.S.) 15, quai Anatole France—75—Paris (7ème).
Centre d'Etudes et de Recherches de Charbonnages de France (CERCHAR) 35, rue Saint-Dominique—75—Paris (7ème).
Delégation Génerale à la Recherche Scientifique et Technique, 103 rue de l'Université, Paris - 7.
Electricité de France, 11 bis, rue d' Aguesseau, Paris 8.
Institut National d'Hygiène, 11 bis rue de Milan, Paris 9.
Institut Français des Combustibles et de l'Energie, 3 rue Henri Heine, Paris 16.
Institut Français du Pétrole (I.F.P.), 1 et 4 avenue Bois Préau—92—Pueil-Malmaison.
Institut National de Recherche Chimique Appliqée, 12 Quai Henry IV, Paris 4.
Laboratoire Municipal de la Préfecture de Police, 39 bis rue de Dantzig, Paris 15.
Laboratoire "Prévention de la Pollution atmosphérique" d'Electricité de France, 1 quai de Saint Ouen—93—Saint Denis.
Societé Française des Pétroles BP, 21 rue de la Bienfaisance, Paris 8.
Union Européenne de Medicine Sociale, 1 rue de Courcelles, Paris 9.

Germany
Abgasprüfstelle der DDR, Rudower Chausee 6, 1199 Berlin - Aldershof
Agrikulturchemisches Institut, Heiligenhaus Bez, Am Vogelsang 14, Düsseldorf.
Bundesministerium für Gesundheitswesen, Michaelstr 10, Bad Godesberg.
Deutsche Gesellschaft für Mineralölwissenschaft und Kohlechemie e.V. Mittelweg 180, Hamburg 13.
Deutscher Stadtetag, Lindenallee 11, Köln-Marienburg.
Deutscher Verein von Gas-und Wasserfachmännern Beethovenstr. 17, Frankfurt (Main).
Federal Ministry of Health, Michaelstr. 10, 532 Bad Godesberg.
Gaswärme-Institut Essen e.V. Holbeckshof, Essen-Steele 43.
Hygienisches-Institut, Nueur Kamp 25, Hamburg 6.
Hygiene-Institut de Humboldt-Universität, Otto-Grotewohl-Str. 1. 108 Berlin.
Institut fur Gewerbliche Wasserwirtschaft und Luftreinhaltung, Hohenzollernring 38-40, 5000 KÖLN.
Institut für Grubensicherheit und Arbeitsschutz Kirchgasse 11, Freiberg/Sa.
Institut für Technische Physik der Frauenhofer-Gesellschaft, Königstr 70/74, Stuttgart-Degerloch. Dr.-Ing. Reiher, Director.
Institut für Wasser, Boden und Lufthygiene Corrensplatz 1, Berlin 33.
International Union for Conservation of Life (IUCL).
Secretary: Institut für Biologie und Lebensschutz, D 6229 Schlangenbad—Georganhorn.
Landesinstitut für Arbeitsschutz und Arbeitsmedizin, Kaiserallee 61, 75 Karlsruhe.
Landesanstalt für Bodennutzungsschutz des Landes Nordrhein-Westfalen, 4300 Essen, Eststr. 160.
Ruhrkohlen-Beratung GmbH, Frau-Bertha-Krupp-Str. 4, Essen.
Staubforschungsinstitut des Hauptverbandes der Gewerblichen Berufsgenossenschaften e.V. Langwartweg 103, Bonn, Prof. Winkel, Director
Steinkohlenbergbauverein, Friedrichstr. 2, Essen 1. Prof. Weissner.
Technischer Uberwachungs-Verein Essen e.V. Steubenstr. 53, Essen 1.
Verein Deutscher Eisenhüttenleute, Breite Strasse 27, Düsseldorf.
Verein Deutscher Ingenieure (Kommission Reinhaltung der Luft), Prinz Georg Strasse 77/79, Düsseldorf. Secretary: M. Krämer.
Vereinigung der Grosskesselbesitzer e.V. Kurfürstenstr. 27, Essen 1.

India
All Indian Institute of Hygiene and Public Health. Industrial Health Research Unit, Section of Physiological and Industrial Hygiene, Calcutta.
Central Public Health Engineering Research Institute, 70-71 Civil Lines, Nagpur.

Israel
Central Laboratory of Air Pollution and Radiation Hazards, 27 Prof. Shor St. Tel-Aviv.
Public Council for the Prevention of Noise and Air Pollution, Tel-Aviv, P.O. Box 20127.

Italy
Consiglio Nazionale delle Ricerche Pizzale delle Scienza 7, Rome.
ILVA Society, Via Corsica 4, Genoa.
Institute of Hygiene, University of Ferrara, Corso Giovecca 173A, Ferrara.
Institute of Hygiene, University of Genoa, Via A. Pastore 1, Genoa.
Instituto di Ingegneria Sanitaria del Politecnico di Milano, Piazza Leonardo da Vinci, 32, Milan.
Instituto Superiore di Santia, Viale Regina Elena 299, Rome.
Stazione Sperimentale per i Combustibili, Via De Gasperi 3, Milan.
NANS (Union of Nations for Fight against Noise and Smog) via Garibaldi, 24, Turin.

Japan
The Institute of Public Health, 1-39, Shiba Shirogane Daimachi, Minato-ku, Tokyo.
Kanto-Shin-Etsu Heat Control Soceity, 54 Takata-Oimatsu-cho, Bunkyo-ku, Tokyo.
Osaka Institute of Hygiene, 38 Kitaogimachi, Kita-Ku, Osaka.

Malta
National Society for Clean Air of Malta, 8-10 Civic Centre, Senglea.

Mexico
Instituto de Geofisica, Torre de Ciencias, Ciudad Universitaria, Mexico 20.

Netherlands
Atmospheric Pollution Division; 14 Duinweg, The Hague.
Central Organisation/Applied Scientific Research T.N.O. Committee for Industrial Air Pollution, 12, Koningskade, The Hague.
Commission for Soil, Water and Air, Baan 170, Rotterdam.
Council for Air Pollution, Zeestraat 73, The Hague.
Netherlands Association for Water, Soil and Air Pollution. Nienwe Achtergracht 100, Amsterdam.
Research Institute for Public Health Engineering T.N.O., (Organization for Health Research T.N.O.) Industrial Air Pollution Division, 97, Schoemakerstraat Delft.
Stichting Concawe (For conservation of clean air and water from oil refinery activities in Western Europe). Secretary: Mr. E. H. Hubbard, 21 President Kennedy Laan, The Hague.

Norway
Institute of Hygiene, University of Oslo, Blindern, Oslo.
Røykskaderädet, Meltzersgt 4, Oslo Dep. Oslo 1.

Poland
Air Pollution Control, Central State Board for National Water Economy, ul. Swietokrzyska 12, Warsaw.
Polish Academy of Sciences, ul. Hagera 17, Zabrze.

Portugal
Instituto Superior Ciencias, Sociais Universidade Técnica, Lisbon.

South Africa
Air Pollution Research Group of the Council for Scientific and Industrial Research, P.O. Box 395, Pretoria, Transvaal.

Spain
Municipal Institute of Hygiene, Place de Lesseps 1 Barcelona.

Sweden
National Swedish Nature Conservancy Office Air Quality Department, Fack, 171 20 Solna 1

Swedish Water and Air Pollution Research Laboratory, Drottning Kristinas väg 47 D 114 28 Stockholm

National Institute of Public Health, 104 01 Stockholm 60.

International Meteorological Institute, Tulegatan 41, 113 53 Stockholm.

AB Bahco, 199 01 Enköping 1

AB Svenska Fläktfabriken, Box 20 040, Stockholm 20.

Switzerland
Eidgenössische Kommission für Lufthygiene Kreuzstrasse 26, 8008 Zürich.

U.S.A.
Air Pollution Control Association, 4400 Fifth Avenue, Pittsburgh, 15213.
Bituminous Coal Research Inc., 35 Hochberg Road, Monroe, Pittsburgh 13, PA.
National Air Pollution Control Administration, 801 N. Randolph Street, Arlington, Virginia 22203.

Other U.S. Govermental Air Pollution Agencies and individual State Agencies are listed in an annual Directory published by the Air Pollution Control Association in co-operation with the U.S. Dept., of Health, Education and Welfare. A copy of this Directory is available at the library of the National Society for Clean Air.

U.S.S.R.
Institute of Communal Hygiene, Pogodinskaja 10, Moscow.
Medical Control Committee on Air Pollution, State Medical Commission, Moscow.

World Health Organization
Division of Environmental Sanitation, Palais des Nations, Geneva, Switzerland.

Guide to Publications

This list of available books, reports and pamphlets on smoke prevention, atmospheric pollution and fuel usage is issued by the National Society for Clean Air as a reference guide for readers. It may also be used for ordering the publications which may be obtained either direct from the Society, or other bookseller. In ordering from the Society please quote the code number preceding each title.

Prices in brackets include postage and packing, which must be included when ordering by post. If a number of items are ordered together excess postages will be refunded. Prices quoted are those current at the date of publication, and are subject to variation.

Information about older, out-of-print, and overseas publications may be obtained from the Society on request. Most of these are in the Society's library and can be consulted, or in some cases borrowed for short periods, by arrangement.

Except where otherwise stated the publisher is the Society. H.M.S.O.—H.M. Stationery Office. The publications are numbered and orders to the Society may be made by the code number.

Legislation

Acts and Memoranda

82. **Clean Air Act, 1956.** The Statute governing smoke, containing sections on dark smoke, smoke from furnaces, grit and dust from furnaces, smoke control areas, smoke nuisances, special cases, clean air council and miscellaneous provisions. (H.M.S.O., 1956) 4 & 5 Eliz. 2 Ch. 52. 2s. (2s. 6d.)

83. **Clean Air Act, 1956.** Memorandum on Smoke Control Areas. (H.M.S.O., 1956) 1s. 3d. (1s. 8d.)

84. **Clean Air Act, 1956**. Memorandum on Miscellaneous Provisions. (H.M.S.O., 1956) 8d. (1s. 2d.)

85. **Amendment to Model Byelaws.** Series IV Buildings (1953) Edition. (H.M.S.O., 1956) 2d. (8d.)

80. **The Clean Air Act, 1956.** A descriptive Summary. (N.S.C.A.) 4s. 6d. per dozen, post free, 6d. single copy.

105. **Thermal Insulation (Industrial Buildings) Act, 1957.** (5 & 6 Eliz. 2 Ch. 40). (H.M.S.O., 1957) 6d. (1s.)

118. **Clean Air Act, 1956. Memorandum on Miscellaneous Provisions (Scotland).** (H.M.S.O., 1959) 1s. (1s. 6d.)

195. **Housing Act, 1964.** (H.M.S.O.). 8s. 6d. (9s. 6d)

196. **West Riding County Council (General Powers) Act, 1964.** (H.M.S.O.) 3s. (3s. 6d)

197. **Clean Air Act (Northern Ireland), 1964, Belfast.** (H.M.S.O.) 3s. 6d. (4s.)

262. **Chimney Heights. Second edition of the 1956 Clean Air Act Memorandum** (H.M.S.O., 1967) 2s. 6d (3s.)

262(a). **Chimney Heights Charts.** The Appendices to the Clean Air Act publication "Chimney Heights" printed on permatrace. (H.M.S.O., 1967) 14s. (15s.)

264. **Report of the Working Party on Grit and Dust Emission.** (M.H.L.G. Memorandum). (H.M.S.O.) 3s. (3s. 6d)

278. **Clean Air Act, 1968.** (H.M.S.O., 1968). Eliz. 2 Ch. 62. 2s. (2s. 6d.)

Regulations (Statutory Instruments)

86. **Clean Air: The Smoke Control Areas (Authorized Fuels) Regulations, 1956.** Statutory Instruments, 1956 No. 2023. (H.M.S.O., 1956) 2d. (8d.)

104. **Clean Air Council Order, 1957.** Statutory Instruments No. 766, 1957. (H.M.S.O.) 3d (9d.)

113. **Smoke Control Areas (Exempted Fireplaces) Order, 1957.** S.I. No. 541, 1957. (H.M.S.O.) 2d. (8d.)

233. **Alkali, etc., Works Order, 1966.** S.I. No. 1143, 1966. (H.M.S.O.) 1s. 6d. (1s. 11d.)

117. **Dark Smoke (Permitted Periods) Regulations,** 1958. S.I. No. 498, 1958. 3d. (9d.)

119. **Dark Smoke (Permitted Periods) (Vessels) Regulations, 1958).** S.I. No. 878, 1958. (H.M.S.O.) 3d. (9d.)

120. **Clean Air Act, 1956 (Appointed Day No. 2) (Scotland) Order, 1958.** S.I. No. 1931, 1958. (H.M.S.O.) 2d. (8d.)

121. **Alkali, etc., Works (Scotland) Order, 1958.** S.I. No. 1932, 1958. (H.M.S.O.) 3d. (9d.)

122. **Dark Smoke (Permitted Periods) (Scotland) Regulations, 1958.** S.I. No. 1933, 1958. (H.M.S.O.) 3d. (9d.)

123. **Dark Smoke (Permitted Periods) (Vessels) (Scotland) Regulations, 1958.** S.I. No. 1934, 1958. (H.M.S.O.) 3d. (9d.)

137. **Smoke Control Areas (Exemption Fireplaces Order, 1959.** S.I. No. 1207, 1959. (H.M.S.O.) 3d. (9d)

139. **Smoke Control Areas (Exemption Fireplaces) (Scotland) Order, 1959.** S.I. No. 2264 (S. 123), 1959. (H.M.S.O.) 3d. (9d.)

191. **Clean Air: The Smoke Control Areas (Authorized Fuels) Regulations, 1963.** S.I. No. 1275, 1963. (H.M.S.O., 1963) 3d. (9d.)

198. **The Alkali etc., Works (Scotland) Order, 1965.** S.I. No. 478 (S. 23) 1965. (H.M.S.O.) 9d. (1s. 3d.)

204. **The Building Standards (Scotland) Regulation, 1963.** S.I. No. 1897 (S. 102) 1963. (H.M.S.O.) 11s. 6d. (12s. 6d)

219. **The Smoke Control Areas (Exempted Fireplaces) (Scotland) Order, 1965.** S.I. No. 1284 (S. 57). (H.M.S.O.) 3d. (9d.)

220. **The Smoke Control Areas (Authorized Fuels) Regulations 1965.** S.I. No. 1508. (H.M.S.O.) 3d. (9d.)

221. **The Smoke Control Areas (Exemption Fireplaces) Order, 1966.** S.I. No. 217. (H.M.S.O.) 3d. (9d.)

222. **The Smoke Control Areas (Exempted Fireplaces) (Scotland) Order, 1966.** S.I. No. 715 (S. 46). (H.M.S.O.) 5d. (11d)

223. **The Smoke Control Areas (Authorized (Fuels) (Scotland) Regulations, 1966.** S.I. No. 714 (S. 45). (H.M.S.O.) 3d. (9d.)

234. **The Motor Vehicles (Construction and Use) Regulations, 1966.** (H.M.S.O.) 6s. 9d. (7s. 6d.)

263. **The Clean Air (Measurement of Grit and Dust) Regulations, 1968.** S.I. No. 431 (H.M.S.O.) 6d. (1s.)

279. **The Clean Air Act, 1968 (Commencement No. 1) Order, 1968.** S.I. No. 1922 (C. 27). (H.M.S.O.) 6d. (1s.)

290. **The Smoke Control Areas (Exempted Fireplaces) Order, 1969.** S.I. No. 164. (H.M.S.O.) 6d. (1s.)

291. **The Clean Air (Height of Chimneys) (Prescribed Form) Regulations, 1969.** S.I. No. 412. (H.M.S.O.) 1s. (1s. 6d.)

296. **The Clean Air Act 1968 (Commencement No. 2) Order 1969. Made 22 July 1969.** S.I. No. 995 (C. 24) (H.M.S.O.) 4d. (10d.)

297. **The Clean Air (Emission of Dark Smoke) (Exemption) Regulations 1969.** S.I. No. 1263 (H.M.S.O.) 9d. (1s. 3d.)

298. **Clean Air: The Smoke Control Areas (Authorized Fuels) Regulations 1969.** S.I. No. 1798. (H.M.S.O.) 4d. (10d.)

303. **Clean Air: The Smoke Control Areas (Exempted Fireplaces) Order 1970.** S.I. No. 615 (H.M.S.O.) 9d. (1s. 3d.)

Circulars

124. **Smoke Control Areas.** Circular No. 5/59 (26/1/1959). (H.M.S.O.) 6d (1s.)

138. **Exemption Fireplaces Order, 1959.** Circular No. 44/59 (16/7/1959). (H.M.S.O.) 3d. (9d.)

164. **Use of Sticks and Paper in Smoke Control** Areas. Circular No. 28/60 (7/7/60). (H.M.S.O.) 9d. (1s. 3d.)

166. **Notification of Provisional Plans for establishing Smoke Control Areas.** Circular No. 1/61 (16/1/1961). (H.M.S.O.) 3d. (8d.)

167. **Air Pollution—Measurement and Research.** Circular No. 12/61 (10/4/1961). (H.M.S.O.) 3d. (9d.)

168. **Selection of Open Fires for Coke Burning.** Circular No. 28/61 (5/6/1961). (H.M.S.O.) 3d. (9d.)

169. **Works of Adaption Eligible for Grant.** Circular No. 31/61 (26/6/1961). (H.M.S.O.) 3d. (9d.)

170. **Industrial Furnaces.** Circular No. 42/61 (29/8/1961). (H.M.S.O.) 2d. (8d.)

171. **Smoke Control in the Black Areas.** Circular No. 4/62 (30/1/1962 (H.M.S.O.) 5d. (10d.)

172. **Smoke Control Areas.** Circular No. 3/62 (30/1/1962). (H.M.S.O.) 1s. (1s. 6d.)

177. **Alkali, etc., Works Regulations Act, 1906.** Circular No. 23/63 (22/3/63). (H.M.S.O.) 1s. (1s. 6d.)

178. **"Homes for Today and Tomorrow".** Circular No. 13/62 (12/2/62). (H.M.S.O.) 3d. (8d.)

179. **Fuel Storage in New Local Authority Housing.** Circular No. 50/62 (1/10/62). (H.M.S.O.) 3d. (9d.)

180. **Smoke Control Programmes, 1962-1966.** Circular No. 60/62 (18/12/62). (H.M.S.O.) 3d. (9d.)

181. **Gas Cokes as Open Fire Fuels.** Circular No. 7/63 (2/4/63). (H.M.S.O.) 8d. (1s. 1d.)

188. **Chimney Heights.** Circular No. 25/63 (15/5/63). (H.M.S.O.) 3d. (9d.)

190. **Smoke Control Areas.** Circular No. 69/63 (17/12/63). (H.M.S.O.) 1s. (1s. 6d.)

205. **Housing Act 1964. Section 95: Amendment of the Clean Air Act, 1956.** Circular No 46/64 (14/8/64). (H.M.S.O.) 5d. (11d.)

206. **Housing Act 1964. Designation of Direct Acting Electric Space-Heaters.** Circular No. 60/64 (18/12/64). (H.M.S.O.) 3d. (9d.)

207. **Disposal of old Motor Vehicles.** Circular No. 8/65 (11/2/65). (H.M.S.O.) 9d. (1s. 3d.)

208. **Smoke Control Areas: Supplies of Solid Smokeless Fuel.** Circular No. 13/65 (17/3/65). (H.M.S.O.) 9d. (1s. 3d.)

209. **Heating of Public Buildings.** Circular No. 46/65 (2/6/65). (M.H.L.G.)

265. **Smoke Control Areas: Grant Arrangements.** Circular No. 51/65 (29/6/65). (H.M.S.O.) 9d. (1s. 3d.)

224. **Tall Buildings and Industrial Emissions.** Circular No. 69/65 (18/10/65). (H.M.S.O.) 3d. (9d.)

225. **Smoke Control Areas: Estimates and Final Costs.** Circular No. 77/65 (31/12/65). 9d. (1s. 3d.)

226. **Smoke Control Areas (Authorized Fuels) (No. 2) Regulations, 1965.** Circular No. 18/66. (16/3/66). (H.M.S.O.) 3d. (9d.)

235. **I. Grant Arrangements; II. Model Question and Answer Booklet; III. Exempted** Appliances. Circular No. 25/66 (3/6/66). (H.M.S.O.) 1s. (1s. 6d.)

236. **Supplies of Solid Smokeless Fuels.** Circular 25/67 (Ministry of Housing and Local Government) Circular 35/67 (Welsh Office) (30/5/67) 8d. (1s. 2d.)

266. **Grit and Dust.** Circulars 56/67 (M.H.L.G.) 23/67 (W.O.) 5d. (10d.)

267. **The Clean Air (Measurement of Grit and Dust) Regulations, 1968.** Circulars 11/68 (M.H.L.G.), 14/68 (W.O.) 6d. (1s.)

280. **Designation of Direct Acting Electric Space Heaters, 1968.** Circulars 46/68 (M.H.L.G.) 40/68 (W.O.) 6d. (1s.)

281. **Clean Air Act, 1968. Explanatory Memorandum on Sections 2, 6 and 8 to 15, 1968.** Circulars 69/68 (M.H.L.G.), 62/68 (W.O.) 1s. 9d. (2s. 3d.)

292. **Clean Air Act, 1968. I. The Clean Air (Height of Chimneys) (Prescribed Form) Regulations 1969; II. The Clean Air (Height of Chimneys) (Exemption) Regulations, 1969.** Circulars 28/69 (M.H.L.G.), 23/69 (W.O.) 9d. (1s. 3d.)

293. **Clean Air Act 1968. Explanatory Memorandum on Sections 1, 3, 4, 5 and 7 of the Clean Air Act, 1968.** Circulars 54/69 (M.H.L.G.), 51/69 (W.O.) (H.M.S.O.) 9d. (1s. 3d.)

294. **Clean Air Act 1968. (A.) The Clean Air (Emission of Dark Smoke) (Exemptions) Regulations 1969. (B.) The Clean Air (Arrestment Plant (Exemption) Regulations, 1969.** Circulars 72/69 (M.H.L.G.), 71/69 (W.O.) (H.M.S.O.) 1s. 3d. (1s. 9d.)

295. **Clean Air Act, 1956. The Smoke Control Areas (Authorized Fuels) Regulations, 1969.** Circulars 97/69 (M.H.L.G.), 95/69 (W.O.) 4d. (10d.)

304. **Clean Air Act 1956. Exempted Fireplaces.** Circulars 25/70 (M.H.L.G.) 29/70 (W.O.) 4d. (10d.)

305. **The Smoke Control Areas (Authorised Fuels) Regulations 1970.** S.I. No. 807. (H.M.S.O.) 6d. (1s.)

306. **Clean Air Act 1956. The Smoke Control Areas (Authorised Fuels) Regulations 1970.** (M.H.L.G.) 42/70. 4d. (10d.)

Other Government Publications

58. **Committee on Air Pollution**. The Interim Report of the Beaver Committee appointed in July, 1953, to examine the nature, causes and effects of air pollution and the efficiency of present preventive measures; to consider what further preventive measure are practicable; and to make recommendations. (Cmnd. 9011), (H.M.S.O., 1953) 3s. 9d. (4s. 3d.)

71. **Committee on Air Pollution.** The Final Report of the Beaver Committee. (Cmd. 9322). (H.M.S.O., 1954) 4s. 6d. (5s.)

132. **The Efficient Use of Fuel.** (H.M.S.O., for Ministry of Power) 35s. (40s.)

The Investigation of Atmospheric Pollution. Reports by the Fuel Research or Warren Spring Laboratory, Ministry of Technology co-ordinating local observations of atmospheric pollution.

75. **27th Report (1944-54).** (H.M.S.O., 1955) 7s. 6d. (8s. 2d.)

106. **28th Report (1954-55).** H.M.S.O., 1957) 5s. 6d. (6s. 1d.)

134. **29th Report (1955-56).** (H.M.S.O., 1958) 7s. (7s. 8d.)

238. **32nd Report (1958-66).** (H.M.S.O., 1967) 10s. 6d (11s. 2d.)

182. **Smoke Control (England and Wales), 1962-66.** Summary of programmes of local Authorities for establishment of Smoke Control Areas. (Cmnd. 1890, H.M.S.O.). (3s. 6d. (4s.)

227. **101st Annual Report on Alkali etc., Works for 1964.** Chief Inspectors, (H.M.S.O., 1965) 5s. 6d. (6s.)

228. **102nd Annual Report on Alkali etc., Works for 1965.** Chief Inspectors, (H.M.S.O., 1966) 7s. 6d. (8s.)

229. **103rd Annual Report on Alkali etc., Works for 1966.** Chief Inspectors, (H.M.S.O., 1967) 7s. 6d. (8s.)

282. **104th Annual Report on Alkali etc., Works for 1967.** Chief Inspectors, (H.M.S.O., 1968) 7s. 6d. (8s.)

268. **Report of the Working Party on Grit and Dust Emission.** (H.M.S.O.) 3s. (3s. 6d.)

269 **Fuel Policy (Presented to Parliament by the Ministry of Power, October, 1965).** (Cmnd. 2798.) (H.M.S.O.) 3s. (3s. 6d.)

270. **Fuel Policy (Presented to Parliament by the Ministry of Power, November, 1967)** (Cmnd. 3438.) (H.M.S.O.) 8s. (8s. 6d.)

271. **Car for Cities. Reports of the Steering Group and Working Group appointed by the Minister of Transport.** (H.M.S.O.) £1 1s. (£1 3s.)

283. **Emission from Cold Blast Cupolas at Iron** Foundries, 1969. (H.M.S.O.) (2s. 6d net)

284. **Warren Spring Laboratory Report for 1967.** Ministry of Technology, pp. 69. (H.M.S.O.) (9s. 6d. net)

299. **105th Annual Report on Alkali etc., Works for 1968.** Chief Inspectors, (H.M.S.O., 1969) 9s. 6d (10s. 6d.)

General

13. **Smokeless Air.** The Society's quarterly magazine-type journal. News, articles, photographs, comment. 20s. per annum, 5s. each (5s. 6d.)

131. **Air Pollution.** Ed. M. W. Thring. (Butterworths). 42s. (46s.)

15. **Fumifugium or the Smoake of London Dissipated.** John Evelyn. The famous diarist's well-known tract (1661) reprinted by the Society. Special tercentenary issue. Paperback. 2s. 6d. (3s.)

183. **Air Pollution.** Ed. Arthur C. Stern. 1968. Vol. 1: Air Pollution and its Effects, pp. 850. £15 3s. 6d. (£15 8s. 6d. Vol. 2: Analysis Monitoring and Surveying. £16 6s. 6d. (£16 11s. 6d.) Vol. 3: Sources of Air Pollution and their Control. £22 3s. 6d. (£22 10s. 0d.)

193. **Smoke Inspector's Handbook** by A. Coe and I. M. Coe, 2 volumes. £7 10s. (not available separately) (£7 15s.)

194. **The Control of Air Pollution.** Alan Gilpin. pp. 514. Royal 8vo. London, Butterworths. 130s. (135s.)

210. **Atmospheric Pollution: Its Origins and Prevention.** Meetham, A. R., in collab. with Bottom, D. W. and Cayton, S. 3rd revised edition. pp. 301. Pergamon Press, Oxford. 70s. (73s.)

212. **Gas Purification Processes.** Ed. by G. Nonhebel. pp. 894. George Newnes, London. £7 (£7 5s.)

229. **Air Pollution.** Smith, A. R. Monograph No. 22, Society of Chemical Industry, 14 Belgrave Square, London, S.W.1. 1966. £3 10s. (£3 13s.)

300. **Clean Air—Law & Practice, Third Edition.** Garner, J. P., and Crow, R. K., 1969, pp. 506. Shaw & Sons Ltd. £5 5s. (£5 10s.)

301. **The Environmental Revolution,** Nicholson M., Hodder & Stoughton. 84s. (89s.)

Conference Proceedings

(Details of earlier Conference Proceedings available on request)

61. **Glasgow Conference, 1953.** The Des Vœux Memorial Lecture—"Atmospheric Pollution in Relation to Preventive Medicine," and papers on the London Fog Disaster, Smokeless Zones, Production, Use and Availability of Solid Smokeless Fuels and the Efficient and Smokeless Combustion of Fuel Oils. 7s. 6d. (8s. 6d.)

70. **Scarborough Conference, 1954.** The Des Vœux Memorial Lecture—"Air Pollution and Plant Life," Address by Sir Hugh Beaver, Presidential Address: "The Coal Crisis and the Society." papers on Rail Transport and Smoke Abatement, the Industrial Uses of Gas and the Industrial Uses of Electricity. 7s. 6d. (8s. 6d.)

87. **Southport Conference, 1956.** The Des Vœux Memorial Lecture—"Clean Air: The Next Chapter," Presidential Address, Progress Reports, Local Authorities and the Clean Air Act, Clean Air and the Housewife. 12s. 6d. (13s. 6d.)

98. **Hastings Conference, 1957.** The Des Vœux Memorial Lecture—"Meteorology and Air Pollution," Address by the Minister of Power, Lord Mills, Presidential Address, and papers on the Administration of the Clean Air Act, Industry and the Clean Air Act, and Pollution from Road Vehicles. 12s. 6d. (13s. 6d.)

126. **Llandudno Conference, 1958.** The Des Vœux Memorial Lecture—"Clean Air, Urban Amenity, and the Growth of Towns," Address by the Minister of Housing and Local Government, Presidential Address, Industrial Aspects of the Clean Air Act, Forum on Smoke Control Areas. and papers on Air Pollution in London and its Smokeless Zones, Air Pollution and Respiratory Disease, Hazards from Airborne Radioactive Matter, and An Automatic Stoker for Central Heating. 12s. 6d. (13s. 6d.)

140. **London, 1959: Diamond Jubilee International Clean Air Conference.** Containing Opening Address by Sir Graham Sutton, F.R.S.; 78 papers on National Air Pollution Problems, Legislation, Education; Technical Problems; Observations. Investigation and Measurement; Research and International Co-operation; Discussions and Authors' Replies. 30s. (35s.). (Reprints available of some of the Papers).

144. **Harrogate Conference, 1960.** The Des Vœux Memorial Lecture—"Clean Air, Public Opinion and the Press," Address by Parliamentary Secretary, Ministry of Housing and Local Government, Series of progress reports on (1) Research and Investigation; (2) Domestic Heating; (3) Industrial Problems, Papers on Air Pollution from Road Vehicles, and in Inquiry into the Working of the Clean Air Act. 25s. (26s.)

175. **Brighton Conference, 1961.** Opening Address by John C. George, Parliamentary Secretary, Ministry of Power, Presidential Address by Lord Cohen of Birkenhead. Reports on National Survey of Air Pollution. Furnace Operators Bill, Diesel Smoke; Papers on Industrial Aspects of the Clean Air Act, Whole House Heating, Smoke Control Areas and Transatlantic Discussion. 15s. (16s.)

214. **Harrogate Conference, 1964.** Opening Address by the Rt. Hon. Lord Sherfield. Presidential Address by Dr. Albert Parker. Smoke Control Area Reports from eight regions; two papers on Air Pollution and Town Planning, four papers on the future supply of smokeless Des Vœux Memorial Lecture—"A Century of Achievement"; a paper on road vehicle pollution and discussion on the Sulphur Dioxide Report. 25s. (26s.)

230. **Eastbourne Conference, 1965.** Opening Address by John Morris, M.P., Parliamentary Secretary, Ministry of Power. Presidential Address by Sir Alan Wilson, F.R.S. Three Reports on Successes with Smoke Control; two papers on solid fuel distribution and supply problem; air pollution and mortality; odour control; control of pollution from road vehicles; four papers on new horizons in domestic heating; two papers on industrial problems; two papers on unresolved problems in air pollution. 25s. (26s.)

272. **Blackpool Conference, 1967.** Opening Address by Stephen Swingler, M.P., Ministry of State, Ministry of Transport, Presidential Address by Sir John Charrington. Report on Air Pollution from road vehicles: some specific air pollution problems; Clean Air and the North West Environment; two papers on effects of pollution on environment; Des Vœux Memorial lecture—"Clean Air and Future Energy"; a paper on the emission of grit and dust from furnaces; the cost of smoke control; a report on smokeless heating in new housing; industrial and municipal incineration of refuse; paper on new oxygen-fuel process in steelmaking. (Only Pre-prints available). 20s. (21s.)

289. **Harrogate Conference, 1968.** Part II: Opening Address by Sir David Pitblado, K.C.B., C.V.O. Presidential Address and Reports of Discussions. 15s.

302. **Eastbourne Conference, 1969.** Part II: Opening Address by Lord Delacourt-Smith, Presidential Address, address on behalf of Baroness Serota and Reports of Discussions. 20s. (21s.)

Reprints of International Congress, London, 1966, Papers

The following papers only are available, in a limited quantity. Price 2s. 6d. each, including postage

241. **Sources and Distribution of Air Pollution Ascertained by Stationery Recording of Gaseous Components.** W. Breuer and K. Winkler.

242. **Study of the Effect of Air Pollution Upon Respiratory Diseases in London in the Winters of 1962-63 and 1963-64.** S. J. Carne.

278. **Collection of Dust from Refuse Incinerators in Electrostatic Precipitators Provided with Multicyclone After-Collectors.** C. Cederholm.

243. **Atmospheric Pollution in Paris by Vehicle Exhaust Gases Measurement of Pollution levels First Suggested Remedies.** P. Chovin and R. Thiebault.

244. **Alleviation of Air Pollution in the Coking Industry.** R. L. Cooper, and G. W. Lee.

245. **Smoke and Sulphur Dioxide in Great Britain: Distribution and Changes.** S. R. Craxford, Marjorie Clifton and Marie-Louise P. M. Weatherly.

246 **Measurements of Concentrations of Particulate Pollutants in Ruhr.** K. H. Friedrichs and A. Brockhaus.

247. **The Working Party on Air Pollution—European Federation of Chemical Engineering.** D. Gall.

248. **The Concentration of Carbon Monoxide Measured at Different Altitudes simultaneously in City Streets.**

249. **Sulphur Dioxide Concentrations Measured around a Modern Power Station.** E. W. F. Gillham, A. Martin and F. R. Barber.

250. **Oil burners for Domestic Application; Present Design and Future Developments.** B. Gills and E. L. Howe.

251. **Calculated Versus Continuously Measured SO_2 Concentrations with Regard to Minimum Stack Heights and Urban Renewal** (urbanisme). K. Gräfe.

252. **Tomorrow's Town Transport—The Advantages of Electric Traction.** A. N. Irens.

253. **Method for the Abatement of Air Pollution caused by Cement Plants.** W. Kohler.

254. **Sub-Minute Continuous Nitrogen Dioxide Analysis.** E. L. Kothny and P. K. Mueller.

255. **Determining Source Reduction Needed to Meet Air Quality Standards.** Ralph I. Larsen.

256. **Progress in Air Pollution Controls in South Africa.** C. E. Latsky and E. C. Halliday.

279. **Collection of Dust from Oil-Fired Boilers in Multi-Cyclones and Electrostatic Precipitators.** S. Maartman.

258. **Tree Belts as a Protection against the Harmattan in Nigeria.** B. A. Molski.

259. **Towards Cleaner Diesel Engine Exhausts.** R. E. Pegg and A. W. Ramsden.

280. **The Role of Gas in the Reduction of Air Pollution.** F. F. Robb.

281. **Air Pollution Monitoring in Canada.** G. R. Ross and H. J. Wilson.

260. **International Dust and Fume Collection Problems.** G. G. Schneider.

282. **Pioneering Experience with High Stacks on the Ovec and American Electric Power Systems.** P. Sporn and T. T. Frankenberg.

283. **Studies on Automatic Recording Apparatus for Measurements of Oxidants in Air.** S. Suzuki.

International Clean Air Congress, London, 1966

239. **Proceedings: Part I** (In English, French and German) 91 papers from 20 countries. World, review, domestic, other space heating and town planning, industrial problems; fumes and gases, research and investigations; standards and regulations, legislation and international co-operation.
40s. (postage and packing extra)

Other Reprints

145. **Some factors concerning Diesel Engine Exhaust Fumes.** J. K. Lock, 1960. 1s. (1s. 6d.)
146. **Methods of Removing Smoke from Road Vehicles.** L. E. Reed and S. C. Wallin, 1960. 1s. (1s. 6d.)
147. **Sampling for 3:4 Benzpyrene in Flue Gas** from Plant fired by Petroleum Fuels. E. L. Howe, 1960. 1s. (1s. 6d.)
148. **Trends in the Pollution of the Air of Great Britain 1952-59.** J. Carroll, S. R. Craxford, H. E. Newall, P. M. Weatherley, 1960. 1s. 3d. (1s. 9d.)
149. **Pollution Levels in Cities.** F. P. Williams, 1960. 1s. (1s. 6d.)
150. **Accuracy and Reliability of Instruments in** Common Use for Measurement of Air Pollu**tion.** S. R. Craxford, E. T. Wilkins, D. W. Slimming, 1960. 1s. (1s. 6d.)
185. **Mitigation of Air Pollution at Coking Plants.** R. L. Cooper and J. P. Graham, 1962. 1s. (1s. 6d.)
186. **Incineration and Waste Disposal.** S. Cayton, 1962. 1s. (1s. 6d.)
215. **Power Stations and Clean Air.** G. N. Stone and A. J. Clarke, 1963. 1s. (1s. 6d.)
232. **Odour Control by Catalytic Combustion.** E. Betz, 1965. 1s. (1s. 6d.)
274. **Corrosion by Air Pollution: A Review.** J. R. Goss, 1967. 1s. (1s. 6d.)
275. **Industrial and Municipal Incineration of Refuse.** E. J. Ostle, 1967. 3s. (3s. 6d.)
276. **Some Minerological Aspects of Air Pollution Damage to Limestone.** K. J. Henley, 1967. 1s. (1s. 6d.)
277. **Presidential Address** by Sir John Charrington, 1967.
285. **Routine Dust Measurement Methods Developed at C.E.R.L.** D. H. Lucas and W. L. Snowhill. 3s. (3s. 6d.)
286. **Black Areas and the National Survey of Smoke and Sulphur Dioxide.** M. Clifton, M. R. Grimoldby and A. J. Sharp. 4s. 6d. (5s.)

Reprints: Des Vœux Memorial Lectures

78. **The Destructive Effects of Air Pollution on Materials.** Dr. A. Parker. 1955. 1s. (1s. 6d.)
102. **Meteorology and Air Pollution.** Sir Graham Sutton, 1957. 1s. (1s. 6d.)
130. **Clean Air, Urban Amenity and the Growth of Towns.** Sir William Holford, 1958. 1s. (1s. 6d.)
214. **A Century of Achievement.** J. S. Carter, 1964. (In Proceedings of 1964 Harrogate Conference and *Smokeless Air* No. 132, Winter, 1964.)
152. **Clean Air, Public Opinion and the Press.** Sir Linton Andrews, 1960. (Advance Proofs only). 9d. (1s. 3d.)
273. **Clean Air and Future Energy.** Dr. E. F. Schumacher. 1967. 1s. (1s. 6d.)

Miscellaneous

93. **Ringelmann Smoke Chart** (with instructional leaflet). Chart for measuring smoke density.
1s. 3d. each, 3 for 3s., 6 for 5s., 12 for 9s. including postage.

112. **'Power's' Microringelmann.** Direct facsimile reduction of the standard Ringelmann Chart (McGraw-Hill). Single copies, 4s. (4s. 6d.)
44s. per dozen, post free.

217. **Sulphur Dioxide.** An Examination of Sulphur Dioxide as an Air Pollutant by the Technical Committee of the Nat. Soc. for Clean Air.
3s. (3s. 6d.)

218. **Notes on the Background to Clean Air for Teachers, Lecturers and others.** 5s. (5s. 6d.)
Clean Air Wall Chart, for use with the above notes. 3s. (4s.)

288. **Air Pollution from Motor Vehicles.** A Report by the Technical Committee of the Nat. So. for Clean Air. 3s. (3s. 6d.)

287. **Clean Air and the Diesel.** Text of an Address given to the East Midland Division of the Nat. Soc. for Clean Air at Peterborough Oct. 29, 1968. C. J. Hind, Director of Eingeering, Perkins Engines Group. (no charge)

Recent Books, Papers and Reports

A Selected List

Industrial

105th Annual Report on Alkali etc. Works for 1968. Chief Inspectors, pp. 84, H.M.S.O., 1969 (9s. 6d.).

Principles and Practices of Incineration. Edited by Corey, R. C. 1969, pp. 297, John Wiley & Sons Ltd. (£7).

Outstanding Air Pollution Problems in the Heavy Clay and Refractories Industry Rowden, E. Nat. Soc. for Clean Air Proc. p. 3, Eastbourne Conf. 1969 (Part 1: 30s. Part 2: 20s.).

The Pottery Industry's Contribution to Clean Air. Holmes, W. H. Nat. Soc. for Clean Air Proc. p. 20, Eastbourne Conf. 1969 (Part 1: 30s. Part 2: 20s.).

Air Pollution Control in Oil Refining. Sutton, P. Nat. Soc. for Clean Air Proc. p. 33, Eastbourne Conf. 1969 (Part 1: 30s. Part 2: 20s.).

Sulphur Oxides and Oil Fuels. Fuller, H. I. Nat. Soc. for Clean Air Proc. p. 61, Eastbourne Conf. 1969 (Part 1: 30s. Part 2: 20s.).

Dust Control in the Cement Industry. Burke, E. Nat. Soc. for Clean Air Proc. p. 80, Eastbourne Conf. 1969 (Part 1: 30s. Part 2: 20s.).

Iron and Steel—Progress Towards Clean Air. Review of Progress. Matthews, P. A. Nat. Soc. for Clean Air Proc. p. 93, Eastbourne Conf. 1969 (Part 1: 30s. Part 2: 20s.).

Iron and Steel—Progress Towards Clean Air. Some Practical Problems. Flux, J. H. Nat. Soc. for Clean Air Proc. p. 104, Eastbourne Conf. 1969 (Part 1: 30s. Part 2: 20s.).

General

The Environmental Revolution. Nicholson, M. Hodder & Stoughton (84s.).

Clean Air—Law and Practice. Third Edition. Garner, J. F., and Crow, R. K. 1969, pp. 506, Shaw & Sons Ltd. (£5 5s.).

Environmental Health Report 1968, pp. 72. Association of Public Health Inspectors, 19 Grosvenor Place, London, S.W.1 (5s.).

The Progress and Effects of Smoke Control in London, 1970. London Boroughs Association (Press Office), The County Hall, London, S.E.1.

Controlling our Environment. Kennet, Lord. Fabian Research Series 283. Fabian Society, 11 Dartmouth Street, London, S.W.1 (3s.).

Clean Air for Teesside. Issued by the Health Committee of the County Borough of Teesside. 1969, pp. 11.

Advances in Environmental Sciences and Technology. Vol. 1 edited by Pitts, J. N., and Metcalf, R. L. 1970, pp. 356, Wiley-Interscience: New York/London (150s.).

Effects of Air Pollution

Air Pollution and Health. A Report for the Royal College of Physicians 1970. London. Pitman Medical Publishing 40s. (hard cover) 30s. (soft cover).

Air Pollution. The Proceedings of the First European Congress on the Influence of Air Pollution on Plants and Animals. Wageningen, 1969. Centre for Agricultural Publishing and Documentation, Wageningen, Netherlands, pp.415 (D.fl.42.50).

Clean Air and Health in London. Lawther, P. J., Waller, R. E. and Martin, A. E. Nat. Soc. for Clean Air Proc. p.17, Eastbourne Conf. 1969 (Part 1: 30s. Part 2: 20s.).

Effects of Chronic Exposure to Low Levels of Carbon Monoxide on Human Health, Behaviour and Performance. 1969. National Academy of Sciences. Standard Book No. 309-01735-1. (Printing and Publishing Office, National Academy of Sciences, 2101 Constitution Avenue, Washington, D.C. 20418).

Road Vehicles

Automobile Emissions—A study in Environmental Benefits Versus Technological Costs. Myers, P. S. 4 Nov., 1969, The Institution of Mechanical Engineers, 1 Birdcage Walk, London, S.W.1.

An Explanatory Study of Automobile Driving Performance under the Influence of Low Levels of Carboxyhaemoglobin. Ray, A. M. and Rockwell, T. H. 1967 (The Ohio State University, Columbus, Ohio, U.S.A.

Research and Investigation

Air Pollution. Report of the Working Party of the European Federation of Chemical Engineering and Directory of the Establishments in Europe engaged on Air Pollution Research, 1969, pp.41, The Institution of Chemical Engineers, 16 Belgrave Sq., London, S.W.1. (30s).

Technical measures of air pollution control in the Iron and Steel Industry. Reports and information on research work subsidized by the E.C.S.C. June, 1968. Commission of the European Communities (Office for Official Publications of the European Communities, Brussels).

Fuel

Dictionary of Fuel Technology. Gilpin, A. 1969, pp.275, Newnes-Butterworths, London (£2 10s).

Films and Filmstrips

Following is a list of films and filmstrips on air pollution and its prevention, fuel efficiency, etc. Application for the loan of the films (or purchase of the filmstrips) should be made to the issuing organization, referred to in the list by its initials, the key to which is given at the end of the list. Most of the films are available free. Two-three weeks advance notice of hire should be given. The running time in minutes is shown. Unless otherwise indicated, the films are available in both 16 and 35 mm. sizes, with sound.

The Society welcomes information on other films suitable for inclusion in future editions of the Year Book.

Films

GENERAL AND EDUCATIONAL

Family Album. The problems of domestic life confronting successive generations of a middle-class family from 1851-1965. 30mins. G.C.

The first Mile Up. The experience of cities in North America making vigorous efforts to combat air pollution. Smoke prevention in Toronto. Particularly well illustrated. 16 mm. 28 mins. G.F.C.

DOMESTIC AND SMOKE CONTROL AREAS

Window to the Sky. Excellent colour film, showing technique of setting up smoke control area. Suitable for general publicity, and for showing to members of local authorities. 16 mins. G.C. & C.F.L.

Clean Air. Colour film dealing with air pollution and showing how modern methods of domestic heating meet the requirements of the Clean Air Act. 21 mins. S-M & B.P. Ltd. & C.F.L.

French Architecture and Modern Heating. Modern solid fuel heating systems in a wide range of applications to buildings all over France are featured in this colour film which has been adapted in English by the N.C.B. Film Unit. 27 mins. N.C.B.

People Like Us. An amusing colour film about solid fuel home-heating. N.C.B.

Housewarming. "The Bartons" decide to install solid smokeless fuel central heating. 17 mins. N.C.B. (In colour).

It Takes Your Breath Away. A review of the causes of "dirty air" as produced by domestic and industrial smoke, traffic, etc. The effect on the lungs of living in this type of atmosphere is briefly shown and the film is of value to Public Health Workers as a means of ramming home the ill effects of a smoky atmosphere. 16 mm. 10 mins. B.M.A.

Gas in Modern Housing. Stresses the need to incorporate clean air principles in new house design. 16 mm. 18 mins. G.C.

Project—Halton Fields. Features a modern housing estate where developers have used domestic oil fired central heating on a district level. Colour. 20 mins. S-M & B.P.

Group Heating in Paisley. District Heating claims great advantages over the more conventional domestic heating particularly in new development areas as shown in this study of urban renewal in Paisley. Colour. 7 mins. N.C.B.

Leicester District Heating. Similar theme to the above but a more ambitious and extensive project. Colour. 10 mins. N.C.B.

Welcome Home. The case histories of three householders in newly created smokeless zones in Sheffield. The range of solid smokeless fuels and heating appliances available is fully covered. Colour. 26 mins. N.C.B.

VEHICLE POLLUTION

You and Your Diesel. The importance of maintenance for diesel-engined lorries and tractors. In colour. 35 mins. S-M &B.P. Ltd.

Horsepower and Hydrocarbons. The California Motor Vehicle Control Board explain the nature and extent of emission problems from the motor car in this film. The alternative to the petrol driven car are examined, as are methods of reducing levels of emission. The first film to approach all aspects of the problem fully. Colour. 22 mins. 16 mm.

FUEL, POWER AND INDUSTRIAL

No tipping. Illustrates a new and revolutionary approach to refuse disposal and shows the threat to clean air posed by traditional methods of refuse disposal. Colour. 14 mins. 16 mm. M.B.T.

Incineration—The Burning Question. Shows another method of refuse disposal and pinpoints the national problem of 17,000,000 tons of refuse needing to be disposed of annually. Colour. 30 mins. J.T.

Fluidized Coal Carbonization and Hot Briquetting. To provide sufficient smokeless fuels to meet the increasing demand, the N.C.B. Coal Research Establishment has developed a new smokeless fuel. 12 mins. N.C.B.

Homefire. Smokeless fuel for the open fire. Based on small-sized smoky coal the new smokeless fuel is now in quantity production at Birch Coppice. The manufacture of the briquettes is explained non-technically. 12 mins. N.C.B. (In colour.)

Using the Coal. Shows various uses of coal, and its place among modern sources of energy. 37 mins. 16 mm. only. N.C.B.

Mechanical Firing of Coal. A group of six colour films presenting the main types of mechanical stoker. Total length 60 mins. N.C.B.

Coal: Our Wasting Asset. This film deals with fuel efficiency, fuel conservation and the problem of smoke. 10 mins. N.C.B.

Saharan Venture. Methane gas from the Sahara is helping to provide Britain with abundant supplies of clean fuel. This film tells the story of the venture in colour. 28 mins. G.C.

The Methane Story. A longer version of the above film made for the benefit of specialists. Emphasizes the methods and techniques employed. Colour, 16 mm. 45 mins. G.C.

Clearing the Air. In many districts much more remains to be done if the Act is to be effective. This film shows the contribution of the Gas Industry to progress. Colour. 12 mins. G.C.

Power in Trust. Electricity plays an important role in all our lives. Through the eyes of a schoolboy the generation of electricity in a modern power station is explained. Colour, 15 minutes. M.R., C.E.G.B.

Atomization. Discusses the technical aspects of combustion of oil fuels, 17 mins. S-M & B.P. Ltd.

Combustion and the Chain Grate Stoker. Shows chemical and physical principles of coal, combustion, and their application in chain grate stoker, 25 mins. B. & W.

Pulverized Fuel. Deals with principles of pulverized fuel use. 40 mins. B. & W.

This Age of Steam. The film emphasizes the growth of world population, rising industrialization and improving standards of living, which result in a rapidly increasing demand for power, chiefly electrical power. Colour. 35 mins. B. & W.

Industrial Electric Heating. Colour film on the use of electricity for industrial heating processes. 30 mins. E.C.

Combustion. An instructional film for service engineers and boilerhouse staff. 30 mins. H.B.

Steam and Steam Generation. Film deals with the properties of steam, early boiler design and the modern steam generator design. Colour. 16 mm. Sound. 31 mins. (International Combustion Ltd.) C.F.L.

Running the Low Ram Stoker. Shows the operational technique for the Low Ram Cooking Stoker. 16 mm. 25 mins. H.B.

Synchromatic. Deals with a new revolutionary under feed stoker showing the working in detail. Colour. 16 mm. 8 mins. H.B.

Gas Flow. Research into the effects of various types of flue baffles and bridge heights. 16 mm. 7 mins. H.B.

Air Flow. Experiments on the hydraulic flow model applied to the Chain Grate stoker. 16 mm. 9 mins. H.B.

The Properties of Coal. Explains difference between various coal gradings. Explanation of swelling number. 16 mm. 18 mins. H.B.

Sea Born Treasure. The purpose of this film is to touch upon the connection between the discovery of gas in the North Sea and the effect its distribution may be expected to have on the national economy and the citizen. 16 mm. Colour, 25 mins. G.C.

Key to Issuing Organizations:

B.M.A.—British Medical Association, Film Library, Tavistock Square, London, W.C.1.

B. & W.—Babcock & Wilcox Ltd., Babcock House, 209 Euston Road, London, N.W.1.

† C.F.C.—Concord Films Council, Nacton, Ipswich, Suffolk.

C.F.L. Central Lilm Library, Government Buildings, Bromyard Avenue, Acton, London, W.3.

E.C. — The Electricity Council Marketing Department, Trafalgar Buildings, 1 Charing Cross, London, S.W.1.

G.C.—The Gas Council, 6-7 Great Chapel Street, London, W.1.

* H.B.—Hodgkinsons Bennis Ltd., Little Hulton, Worsley, Manchester.

J.T.—John Thompson Ltd., Ettingshall, Wolverhampton.

M.B.T.—Motherwell Bridge Tacol Ltd., Green Dragon House, 64-70 High Street, Croydon, Surrey.

M.R., C.E.G.B.—Public Relations, Midlands Region, C.E.G.B., Haslucks Green Road, Shirley, Solihull, Warwickshire.

N.C.B.—National Coal Board, Film Branch, 26-28 Dorset Square, London, N.W.1.

S-M & B.P. Ltd.—Shell-Mex and B.P. Film Library, 25 The Burroughs, Hendon, London, N.W.4.

†Hire Charge of £1 10s per film.

*Hire Charge of £1 per film.

FILM STRIPS

Air Pollution and You. Colour. Traces sources of air pollution and illustrates methods of control in 31 captioned frames. (Produced by Current Affairs Films of New York.) Available, *on loan,* from the Society free of charge to Members. A charge of 3s. 6d. for postage and packing will be made to non-members.

Air Pollution. Black and white. Prepared in consultation with Association of Public Health Inspectors. General survey of problem, methods of measurement, etc. (prepared by Camera Talks). Available from Society, complete with lecture notes, price 2 guineas. (Quote Ref. No. CT.58). Also **The Public Health Inspector.** Colour. £2 12s. 6d. (Quote Ref. No. C.T.24).

The Role of Industry. Colour. Deals with the general problem, illustrates plant and appliances for preventing smoke and grit. (Prepared by Camera Talks in conjunction with Association of Public Health Inspectors). Available from Society, complete with lecture notes, £2 12s 6d.

Smoke Control Areas. Colour. Deals with setting up of smoke control areas. Suitable for general public, officers and members of local authorities. (Prepared by Camera Talks in conjunction with Association of Public Health Inspectors). Available from Society, complete with lecture notes, £2 12s. 6d.

Air Pollution. (A) Its nature, production and effects, and (B) its dispersion and accumulation. Two film strips in colour, each containing 32 frames. Script by R. S. Scorer, PH.D. Foreword by Sir Hugh Beaver. (Prepared by Diana Wyllie Ltd.). Available from Society, price £4 the pair. (Quote Ref. No. DW.F.22/23).

British Standards relating to Air Pollution

B.S.

758 Small domestic hot-water supply boilers using solid fuel.
  Part 1. Manually-controlled boilers.
  Part 2. Thermostat-controlled boilers.

893 Method of testing dust extraction plant and the emission of solids from chimneys of electric power stations.

1251 Open fireplace components (Metric).
  Part 1. Firebacks for use with inset open fires.
  Part 2. Fireplace surrounds and hearths.
  Part 3. Adjustable chimney-throat restrictors (insertible).
  Part 4. Lintels.

1252 Domestic solid fuel cookers with integral boilers.

1334 Thermal insulating materials (Metric).

1747 Methods for the measurements of air pollution (Metric).
  Part 1. Deposit gauges.
  Part 2. Determination of concentration of suspended matter.
  Part 3. Determination of sulphur dioxide.
  Part 4. The lead dioxide method.

1756 Methods for the sampling and analysis of flue gases.
  Part 1. Methods of sampling.
  Part 2. Analysis by the Orsat apparatus.
  Part 3. Analysis by the Haldane apparatus.
  Part 4. Miscellaneous analyses.
  Part 5. Semi-routine analyses.

2740 Simple smoke alarms and alarm metering devices (Metric).

2741 Recommendations for the construction of simple smoke viewers.

2742 Notes on the use of the Ringelmann chart.
  C: 1957 Ringelmann chart (Metric).
  M: 1960 Miniature smoke chart.

2811 Smoke density indicators and recorders (Metric).

2845 Coke-burning inset open fires without boiler and without convection.
  Part 1. Dimensional and constructional requirements.
  Part 2. Performance and constructional requirements.

2978 Measurements of smoke emission from industrial boilers.
  Part 1. Medium capacity coal-fired water-tube boilers with travelling grates.
  Part 2. Coal-fired shell boilers with various types of mechanical stokers.

3107 Small incinerators for the destruction of hospital dressings.

3128 Constructional and performance requirements for inset open fires with boiler and without convection.

3142 Manufactured solid smokeless fuels for household use.
  Part 1. Cokes for domestic open fires.
  Part 2. Cokes for domestic closed appliances.

3250 Thermal testing of domestic solid fuel burning appliances with convection.

Part 1. Flue loss method.
Part 2. Hood method.
3316 Large incinerators for the destruction of hospital waste.
3328 Domestic gas pokers and portable underbar ignition burners.
3376 Open fires with convection, with or without boiler.
3377 Back boilers with domestic solid fuel appliances (Metric).
3378 Domestic heating stoves using coke and other solid fuels.
3405 Simplified methods of measurement of grit and dust emission from chimneys.
3813 Incinerators for waste from trade and residential premises.
Part 1. Capacities between 50 lb/h and 1,000 lb/h.
3841 Method for the measurement of smoke from manufactured solid fuels for domestic open fires.
3929 Domestic solid fuel ignition pokers and portable undergrate ignition burners for use with commercial butane.
4076 Steel chimneys.
4433 Independent thermostatically controlled central heating boilers with rated outputs up to 44 kw.
Part 1. Boilers with undergrate ash removal, designed to burn solid smokeless fuels.
Part 2. Gravity feed boilers designed to burn small anthracite.
PD 6434 Recommendations for the design and testing of smoke reducing solid fuel burning domestic appliances.

All the above Standards are obtainable direct from the British Standards Institution at British Standards House, 2 Park Street, London, W.1 (individual copies) or Newton House, 101-113, Pentonville Road, London, N.1 (bulk orders). British Standards are revised, when necessary, by the issue either of amendment slips or of revised editions. It is important that users of British Standards should ascertain that they are in possession of the latest amendments or editions.

The International Union of Air Pollution Prevention Associations

The International Union that has now been established consists of non-governmental organisations only. Its primary functions are to promote collaboration and the exchange of information on air pollution problems, and to organize, through its member associations, international congresses. Particulars of the six founder member associations are given below. The first Congress of the Union was held in London in 1966.

The Second International Clean Air Congress will be held in Washington, D.C., U.S.A., from 6 December to 11 December 1970. The President will be Dr. C. E. Barthel, Jnr., and the Secretary, Mr. Arnold Arch.

Air Pollution Control Association of America. 4400 Fifth Avenue, Pittsburgh, Pennsylvania 15213.

Established in 1907, with a full-time secretariat since 1950. The Association is a voluntary, co-operative, non-profit organization of 5,000 members who include engineers, scientists, enforcement officials, industrial organizations and manufacturers. The Association serves as a forum for discussion of air pollution problems with technical orientation.

It publishes the monthly *Journal of the Air Pollution Control Association,* as well as its *APCA Abstracts.* The Abstracts contain summaries from 4,000 technical journals throughout the world of current air pollution literature.

The Association, governed by a body of 17 members of the Board of Directors, has the purposes of fostering the control of air pollution and improving sanitation of the air. The Association's Technical Council, composed of 40 volunteer committees, works towards international adoption of reasonable engineering performance standards. In addition to members from the United States, the Association presently has members from 40 other countries.

Executive Secretary: Arnold Arch.

Asociación Argentina Contra la Contaminación del Aire. Sarmiento 680, Buenos Aires, Argentina.

Founded in 1962 as a result of the first Latin American Conference on Air Pollution, and obtained the legal status of a civil association in 1964.

The present membership of 100 includes doctors in medicine, hygiene and chemistry; sanitary engineers, army officers, executives and industrial enterprises. Though non-governmental, many of the members are civil service officers. A grant is made to the association by the municipality of Buenos Aires.

The aims are for the public welfare and to promote the fight against air pollution in the urban and industrial centres of the country, employing scientific, educational and cultural means. An international conference was held at Buenos Aires in November 1965.

President: Dr. José A. Rispoli.
Secretary-General: Dr. Damian D. Torti.

Asociación Mexicana Contra Le Contaminación del Agua. Ye del Aire, A.C., Mexico City, Mexico.

General Secretary: Miguel A. G. Lara.

Association pour la Prévention de la Pollution Atmosphérique. 62 rue de Courcelles, Paris, 8, France.

The objects of the Association are to initiate and co-ordinate studies leading to a better understanding of the problems of air pollution; to organize investigations in the large towns with a view to determining the distribution of air pollution (for which regional groups have been set up); to co-operate with the public authorities in pollution control; to inform and instruct the public; to present exhibitions under the patronage of the Ministry of Social Affairs in the large towns; and to publish the three-monthly journal *Pollution Atmosphérique.*

Secretary-General: M. Y. Queret.

National Society for Clean Air. 134/137 North Street, Brighton, England.

Full details of the Society will be found in later pages of this volume.

Heat Control Society, Japan. Kanto-Shin-Etsu Heat Control Society, 9-17, chóme, Mejorodai, Bunkyo, Tokyo, Japan.

The purposes and activities of the Society are to conduct diagnosis of problems, lecture and training courses (including by correspondence) and other publicity activities to promote efficiency of fuels for the following purposes: (i) prevention of loss of fuels; (ii) prevention of heat losses during transmission and transportation; rationalization of combustion, gasification, distillation, heating and heat transmission; and prevention of air pollution from industrial plant.

There are seven other similar societies covering the whole area of Japan. The eight organize central conferences on heat control. Total expenditure is about £63,000 and total membership about 1,900 concerns.

Central Conference on Heat Control
Standing Director: Takahide Taga
Kanto-Shin Etsu Heat Control Society
Chief Director: Takahide Taga

The Clean Air Society of Australia & New Zealand

Hon. Secretary: G. J. Cleary, Post Office Box 31, George Street North Post Office, Sydney, New South Wales, Australia.

V.D.I.-Kommission Reinhaltung der Luft. Dusseldorf, Graf-Recke-Str. 84, Federal Republic of Germany.

The V.D.I. Clean Air Commission is a specialized section of a technical and scientific association the Verein Deutscher Ingenieure (German Association of Engineers). This Commission comprises collaborators from all the branches of knowledge relating to clear air (including practice legislation and administration), because air pollution is a complex challenge to science.

Their functions include: determining the causes, nature and extent of air pollution; making emission limits for dust and gases; research on the emission of pollutants and on chimney heights; research on the effects of air pollution; fixing the maximum allowable concentrations for ambient air (Maximale Immissions-Konzentrationen, or M.I.K.); establishment or development of standard procedures for the measurement of dusts and gases both at the discharge points and in ambient air.

There are at present in the Commission more than 500 independent experts and scientists (engineers, physicists, chemists, meteorologists, hygienists, botanists, etc.) working in honorary capacities on numerous committees, sub-committees and working-groups. The results of their work are laid down in V.D.I. Richtlinien (directives)—Handbuch Reinhaltung der Luft (*Clean Air Handbook*)—arranged as follows: (i) General; (ii) M.I.K. values; (iii) dispersion of pollutants; (iv) limiting emissions; (v) analysis and measuring techniques. So far, 70 directives have been published; 40 others are either in preparation or planning stage. Furthermore since 1955 the Commission has initiated more than 120 research studies, of which a great part has already been finished. More than 12 million D. Marks have been provided by public funds for this purpose. (More details of the work of the Commission are included in a booklet "Aufbau, Aufgaben, Forschung", which will be supplied on request by the Commission.)

Secretary: J. Krämer, Dipl.Ing.

Besides the V.D.I. Clean Air Commission there exists a special documentation centre (V.D.I.-Fachdokumentation Reinhaltung der Luft) which covers the publications in the whole field of air pollution. Up to now, nearly 50,000 citations have been collected and indexed according to a special system. Comprehensive bibliographies are in preparation.

Secretary: W. Seidl.

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Major Smog Disasters

The word "smog" was first used by the late Dr. H. A. Des Vœux, founder, president of the N.S.A.S., in 1905, to denote the combination of smoke and natural fog that in urban areas may have disastrous consequences. There are numerous cases of smog conditions resulting in a marked rise in mortality and morbidity from respiratory disorders and consequential cardiac failure. Among these incidents are the following.

London, 1873. Rise in bronchitis deaths, compared with the previous week, of 268.

London, 1880. Rise in bronchitis deaths, compared with the previous week, of 692.

London, 1891. Rise in bronchitis deaths, compared with the previous week, of 572.

Glasgow, 1909. Average number of deaths in the three weeks prior to the fog were 57 per week. During five weeks of fog or haze the deaths per week were: 138, 233, 171, 198 and 137.

Manchester and Salford, 1930-31. In December, with no fog, there were 137 respiratory disease deaths. In January there were nine days heavy fog and 592 deaths.

Meuse Valley, 1930. 60 deaths attributed to fog, the death rate rising to 10·5 times the normal. Many cattle had to be slaughtered.

London, 1948. Bronchitis deaths in week before fog, 73; in the week of fog, 148.

Donora, U.S.A., 1948. 18 deaths in a population of 14,000. 42 per cent of the population were estimated to have suffered from illness.

London, 1952. The fog developed on Friday, 5 December and continued until 8 December. Estimated total of 4,000 deaths in the Greater London area. In the Administrative County only deaths from bronchitis rose from 121 to 872, and from heart and circulatory diseases, from 318 to 801.

London, 1956. 1,000 additional deaths attributed to January fog in the Greater London area. (*B.M.J., 31 March, 1956.*)

London, 1962. Fog in London and other areas, December 3-7, with similarities to the 1952 fog, but with 750 additional deaths as compared with 4,000.

Principal References

Mortality and Morbidity during the London Fog of December, 1952. Ministry of Health Public Health Report No. 95. (This report contains a section on "Previous Fog Incidents", with a statistical appendix for those in London.)

Les Problèmes de Pollution de l'Atmosphère, Batta, Firket and Leclerc, Liége, 1937.

Air Pollution in Donora, Pa. Public Health Bulletin, No. 306, Federal Security Agency, Public Health Service, Washington.

1971 Clean Air Conference

The Annual Conference of the National Society for Clean Air will be held in Folkestone from 19th—22nd October

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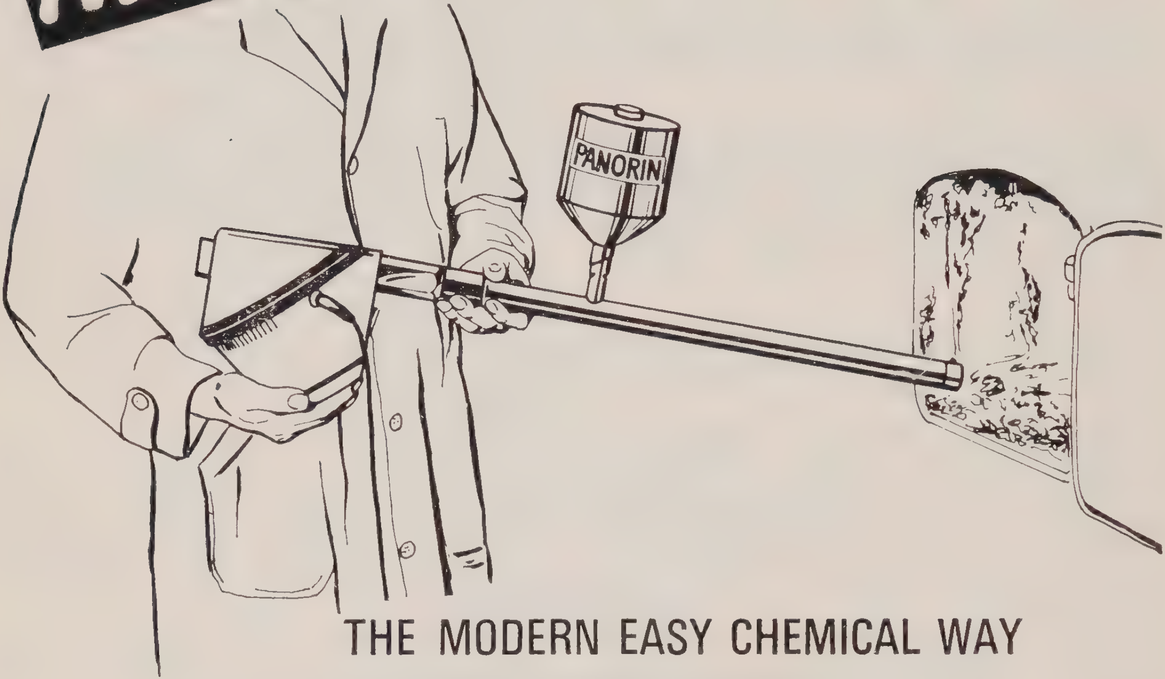

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Archard, Mr. P., Best, Mr. J. K., Blampied, Mr. F. C., Cawley, Lady, Colehan, Mr. J. E., Crook. Mr. S. C., Draper, Mr. P., Freeland, Miss E., Greenwood, Mr. T. A. S., Harris, Mr. J., Kenney, Mr. J. G., Lavebick, Mr. P. M., Redston, Mr. R. V., Trevillion, Mrs. F., Thomas, Mr. L. C., Wakeley, Mr. R. W., Wallis, Mrs. E., Williams, Mr. J. R., Whiting, Mr. G. C.

SOUTH EAST DIVISION

Sustaining Members

British Petroleum Co. Ltd., British Steel Corporation, Central Electricity Board, Coal Merchants Federation of Great Britain, Electricity Council, Esso Petroleum Company Ltd., Gas Council, Greater London Council, Imperial Chemical Industries Ltd., National Carbonising Co. Ltd., National Coal Board, North Thames Gas Board, Shell International Petroleum Co. Ltd., Shell-Mex and B.P. Ltd., South Eastern Gas Board.

Local Authority Members

Amersham R.D.C., Aylesbury, Barking, Barnet, Basildon, Bedford, Bedfordshire C.C., Bexley, Bishop's Stortford, Bletchley, Bognor Regis, Bournemouth, Braintree R.D.C., Brent, Brentwood, Brighton, Bromley, Bullingham R.D.C., Bushey, Camden, Chatham, Chertsey, Chesham, Cheshunt, Chigwell, Colchester, Crawley, Croydon, Cuckfield, Dartford, Dartford R.D.C., Dover, Ealing, Eastbourne, Easthampstead R.D.C., Eastleigh, Elstree R.D.C., Enfield, Epping & Ongar R.D.C., Epsom & Ewell, Esher, Essex C.C., Eton R.D.C., Farnborough, Folkestone, Gillingham, Gosport, Gravesend, Greenwich, Guildford, Guildford R.D.C., Hackney, Hambledon R.D.C., Hammersmith, Harlow, Harrow, Harwich, Hastings, Havant & Waterloo, Havering, Hemel Hempstead, High Wycombe, Hillingdon, Hitchin, Hoddesdon, Hounslow, Hove, Islington, Kensington & Chelsea, Kent C.C., Kingston upon Thames, Lambeth, Leatherhead, Lewisham, Littlehampton, London, Luton, Luton R.D.C., Maidenhead, Merton, New Forest R.D.C., Newham, Northfleet, Oxford, Portsmouth, Reading, Redbridge, Reigate, Richmond upon Thames, Rickmansworth, Rochester, St. Albans, St. Albans R.D.C., Sittingbourne & Milton, Slough, Southampton, Southend on Sea, Southwark, Southwick, Staines, Strood R.D.C., Sutton, Thurrock, Tower Hamlets, Tunbridge Wells, Walton & Weybridge, Watford, Watford R.D.C., Welwyn Garden City, Westminster, New Windsor, Windsor R.D.C., Wolverton, Worthing, Wycombe R.D.C.

Corporate Members

Allied Ironfounders Ltd., Ambuco Limited, Asbestos Information Committee, Association of Public Health Inspectors, Beacon Villages Association, B.I.C.E.R.I. Ltd., British Independent Steel Producers Association, British Medical Association, Buckle, G. H., & Partners, Burmah Oil Trading Ltd., Caltex Services Ltd., Centri-Spray Ltd., Charrington, Gardner, Locket & Co. Ltd., Chemical Construction (GB) Ltd., Coal Utilisation Council, College of Fuel Technology, Drummond Dust & Fume Extractors Ltd., Dust Suppression Ltd., Eastern Gas Board, Easy Heating Company, Electrical Association for Women, Federation of British Cremation Authorities, Ford Motor Company Ltd., A. Guinness, Son & Co. (Park Royal) Ltd., Harrold Leather Mfg. Co. Ltd., Holiday Fellowship Ltd., Institute of Fuel, Institution of Gas Engineers, Institute of Petroleum, John Zink Co. Ltd., Joy Trading Corporation, London & Counties Coke Distributors' Association, London Electricity Board, London Trades Council, London Transport Board, Marshall & Parsons Ltd., Metal Box Company Ltd, Mobil Oil Co. Ltd., Municipal Passenger Transport Association (Inc.), National Federation of Coke Distributors' Associations, Public Transport Association, Radiation Limited, Rickett Cockerell & Co. Ltd., Road Haulage Association Ltd., Royal Society of Health, Solid Smokeless Fuels Federation, South Eastern Electricity Board, Southern Electricity Board, Southern Gas Board, Sturtevant Engineering Co. Ltd., Trist, Ronald, & Co. Ltd., United Kingdom Atomic Energy Authority, White Drummond & Company Ltd., Women's Advisory Council on Solid Fuel, Women's Gas Federation.

Individual Members

Abell, Mr. R. H., Acworth, Miss E. A., Acworth, Miss W. B., Albone, Dr. E. S., Armstrong, Mr. F. W., Bartlam, Mr. J. N., Bastable, Mr. N., Baver, Mr. F. W., Beaumont, Mr. M., Bird, Mrs. E., Bottom, Mr. D. W., Boult, Sir Adrian C., Boult, Miss Olive, Boyd, Miss D., Bradbury-Williams, Mr. J. C., Bradford, Mr. S. G., Bradshaw, Mr. N. F., Brown, Mr. A. W., Brown, Mr. T. J., Bryant, Miss P. M., Buddeley, Dr. A., Buist, Commander C., Burridge, Mr. I. G., Butler, Mr. J. W., Caller, Dr. S., Capes, Mr. F. B., Carpenter, The Reverend V. A., Carter, Dr. J. S., Chapman, Mr. W. B., Chatfield, Mr. A. J., Chivers, Mr. D. P., Clarke, Dr. R. T. V., Clarke, Mr. S. H., Clinch, Mr. H. G., Coker, Mr. W. G., Colville, Lt. Com. R. F., Cotton, Mr. S. A., Courtier, Mr. G. B., Cousin, Lt.-Col. A. J., Crosby, Mr. A. S. B., Curtis, Mr. B., Darbyshire, Miss L. N., Davies, Mr. P. M., Davis, Mr. E. T. A., Day, Mr. L. J., Daynes, Mr. D. A., Dimbleby, Mr. T. E., Dobson, Mr. P. F., East, Mr. R. G., Eaton, Dr. F. J., Elsworthy, Mrs. F. S., Evans, Mr. H. M., Fletcher, Mr. J., Forrester, Dr. C., Fowle, Lady Honor C., Fox, Dr. R. H., Gandy, Mr. H., Gandy, Miss R. L., Garland, Mr. G. E., Gavin, Mr. M. J., Gilbert, Mr. E. D., Gillison, Dr. J. A., Gilpin, Mr. A., Gimpel, Mrs. C., Graves, Mr. T. G., Green, Mr. J., Greenhead, Mr. S., Greenwood, Mrs. E. L., Grove, Mrs. G. I., Hales, Mr. J. S., Held, Mr. P. E. J., Henson, Mr. C. G., Hickman, Miss V., Hoppitt, Mr. H. B., How, Mr. M. D., Hulme, Mr. G. H., Hussey, Mr. R., Ibbetson, Mr. H., Jackson, Mr. C., Jackson, Mr. P. L., James, Mr. B. W., Jellis, Mr. F., Jones, Mr. D. P. G., Jones, Mr. W. L., Kendall, Dr. J. D., Kershaw, Mr. C. A., Kirkpatrick, Mr. D. A., Kitchen, Mr. C. H., Langwell, Mr. W. H., Laundon, Mr. J. R., Lax, Mrs. G., Lee, Mr. S. A., Leverson Gower, Mrs., Lewin, Mr. J. U., Little, Mr. J. W., Lord, Mr. D. G., Lovell-Burgess, Miss M., Macnair, Mr. A. S., Madelin, Sqn. Ldr. I., Mason, Mr. J. K., Matthews, Dr. N. E., McLintock, Dr. S. W., Medawar, Lady, Melland, Mr. B., Mellins, Mrs. M. H., Menuhin, Mr. Yehudi, Messenger, Mrs. J. P., Messenger, Mr. W. E., Miles, Mr. S. E., Monkhouse, Dr. A. C., Moore, Mrs. M.St.A., Moreland, Mr. S., Mowle, Mr. C. R., Myers, Mr. M. R., Nagle, Mr. B. R., Nonhebel, Dr. G., Oliver, Mr. G. T., Parker, Dr. A., Parker, Dr. R. A., Parkinson, Mr. A. C., Parry, Mr. M., Pavey, Mr. A. F., Pedrick, Mr. F., Pennington, Mr. W. J., Phillips, Mr. G. H. Pinguex, Mr. L. Poole, Mrs. W. M., Potter, Dr. N. M., Preston, Dr. T. W., Rayner, Mr. K. F., Rendel, Dr. M. N., Renwick, Dr. and Mrs. J., Rice, Mr. A. P., Richardson, Mr. R. L., Robinson, Mrs. E., Rogers, Mr. E. C., Rogers, Miss J. S., Roper, Captain R., Rosling, Miss E. M., Rundle, Mr. L. G., Sansum, Mrs. E. B., Saunders, Mrs. J., Scorer, Professor R. S., Scotson, Mr. D. A., Scott, Mr. J., Seale, Mr. R. J., Shackcloth, Mr. W., Shanks, Mr. E. C., Shelton, Mr. S. J., Shieldhouse, Mr. B. S., Shillito, Mr. D. E., Smith, Mr. A. R., Smith, Mrs. P., Sowby, Dr. F. D., Spoor, Dr. N. L., Stephenson, Dr. R. J., Stewart, Mr. R. E., Stubbs, Mr. G. C., Sullivan, Mr. J. S., Sutherland, Mr. J. W., Tagg, Mr. J. R., Taylor, Mr. C. P., Thomas, Mr. R. B., Thomas, Mr. R. F., Todd, Mr. G. F., Toussaint, Dr. C. H. C., Train, Dr. D., Turner, Dr. W. C., Vine, Mr. and Mrs. G. M., Des Voeux, Mrs. M. F., Waddell, Mr. A., Watson, Professor, H. E., Wermann, Mr. J. C., Westbrook, Mr. J., White, Dr. H. D. J., White, Mrs. C. P., Whitehead, Mr. B. G., Wickens, Mr. A. A., Wigan, Mr.

H. N., Williams, Mr. H. P., Willison, Mrs. M. E., Yarrow, Mr. C.

SOUTH WALES AND MONMOUTHSHIRE DIVISION

Local Authority Members
Abercan, Aberdare, Abertillery, Barry, Bedwas & Machen, Bedwellty, Bridgend, Caerleon, Caerphilly, Cardiff, Cardiff R.D.C., Cwmbran, Ebbw Vale, Gellygaer, Glamorgan C.C., Llanelli, Llanelli R.D.C., Llantrisant & Llantwit Fadre R.D.C., Magor & St. Mellons R.D.C.,Merthyr Tydfil, Monmouthshire C.C., Mountain Ash, Mynyddislwyn, Neath, Newport, Penarth, Pontypool, Pontypridd, Port Talbot, Swansea, Tredegar, Ystradgynlais R.D.C.

Corporate Members
Ambercwmboi Clean Air Committee, British Steel Corporation, Strip Mills devision, Coal Merchants Federation of Wales, South Wales Electricity Board, Swansea Port Health Authority, Wales Coke Distributors Association, Wales Gas Board.

Individual Members
Bacon, Mr. N. P., Brownrigg, Mr. M. A., Carter, Mr. L. J., Clarke, Mr. J. A., Harrop-Griffiths, Mr. H., Harry, Mr. T. W.,

OVERSEAS DIVISION

Local Authority Members
Durban, Corporation of the City of (South Africa), Geleen, Municipality of (Netherlands), Johannesburg, City of (South Africa), Leichhardt, Municipality of (Australia), Newcastle, City of (Australia), Vereeniging, Town Council of (South Africa).

Corporate Members
Air Pollution Research Group (South Africa), China Light & Power Co. Ltd., (Hong Kong), Du Pont De Nemours International S.A., (Switzerland), Elex S.A., (Switzerland), Hong Kong Electric Co. Ltd., (Hong Kong), New Zealand Clean Air Society (New Zealand), Public Utilities Board—Electricity Department (Singapore).

Individual Members
Anderson, Mrs. P. M. (Australia), Bezares, Mr. Fernando (Spain), Brandt, Mr. William G. Jr. (U.S.A.), Brunelle, Mrs. M. F. (U.S.A.), Buschmann, Mr. C. H. (Netherlands), Chamberlin, Mr. R. L. (U.S.A.), Chantler, Mr. P. (Cyprus), Danson, Mr. J. (Rhodesia), De Coster, Mr. J. P. (Belgium), De Permentier, Mr. Paul R. (Belgium), Easterbrook, J. L. (South Africa), Eldridge, Mr. Gardner, S. (Canada), English, Dr. Bruce, V. (U.S.A.), Easteban, Dr. Felix (Spain), Feige, Mr. H. J. (Israel), First, Professor Melvin W., (U.S.A.), Fitzgerald, Mr. J. L. (Ireland), Fox, Mr. R. D. (U.S.A.), Froelicher, Mrs. F. M. (U.S.A.), Fung, Mr. Lawrence (Hong Kong), Gerhardsson, Mr. Gideon (Sweden), Ghionis, A. (Greece), Ginger, Roy C. (New Zealand), Gladstein, Dr. Tunia M. (Israel), Grafe, Dr. Kurt (Germany), Griffin, Mr. R. (Rhodesia), Hasselhuhn, Mr. Bjorn (Sweden), Hewson, Dr. E. Wendell (U.S.A.), Hobbs, Mr. R. L. (Australia), Hooton, Mr. K. A. H. (U.S.A.), Hornbeck, Mr. D. D. (U.S.A.), Hunigen, Dr.-Ing. Edmund (Germany), Johnson, Mr. K. R. (South Africa), Jones, Mr. Evan H. (South Africa), Jones, Mrs. M. A. (South Africa), Kettner, Dr. Helmut (Germany), Lordin, Mr. H. C. (U.S.A.), Mueller, Dr. Peter K. (U.S.A.), O'Connor, Dr. T. C. (Ireland), Pedrero, Dr. Pablo Sanz (Spain), Pepperdine, E. C. (Gibraltar). Plamondon, Mr. Sarto R. (Canada), Ratnasingam, M. (West Malaysia), Rebello Professor F. P. (Brasil), Reif, A. E. (U.S.A.), Gueltiero Rossi (Italy), Ruff, Mr. C. D. (U.S.A.), Smith, Mr. E. M. (U.S.A.), Sordelli, Dr. Danilo (Italy), Strach, Mr. L. (Germany), Taga, Mr. Takahide (Japan), Triffett, Mr. A. C. (Australia), Wight, Dr. J. Earle, (Canada), Wise, Mr. William (U.S.A.),

Summary of Divisional Accounts
For the period 1 January 1969 to 31 March 1970

Division	*Balance as at 1 January, 1969*			*Grants*			*Other Income*			*Expenditure*			*Balance as at 31 March, 1970*		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Scotland	133	3	3	100	0	0	364	11	10	402	6	3	195	8	10*
Northern Ireland	46	2	7	30	0	0	188	0	0	116	11	8	147	10	11
North West	70	3	9	98	0	0	70	0	0	90	12	4	147	11	5
North East	39	14	0	41	0	0	1	2	1	23	14	0	57	2	1
Yorkshire	29	15	4	55	0	0		—		75	14	1	9	1	3
West Midlands	171	6	7	39	0	0		—		43	3	11	167	2	8
East Midlands	64	3	3	48	17	6		—		43	2	0	69	18	9
South West	109	3	11		—			—		52	10	7	56	13	4
South East	53	6	1	100	0	0	1	0	4	90	8	1	63	18	10
South Wales & Mon. ..	98	2	2	29	15	0		—		13	10	8	114	6	6

* Balance as at 31 December 1969.

40th Annual Report 1969

Although this is called an Annual Report, this is really a misnomer, for it covers the period from 1 January 1969 to 31 March 1970.

Early in 1969, the Council decided that, in future, the Society's financial year would run from 1 April to 31 March to bring everything more into line with the financial year of the majority of members. This step was taken this year, and this has resulted in this report covering a period of 15 months.

1968 saw the passing of Mr. Robert Maxwell's Clean Air Bill and 1969 saw the implementation of the Act in two main sections. Certain provisions of the Act were brought into force on 1 April, and the remainder came into operation on 1 October. The Society had welcomed the passing of this Act which represented another big step forward in the cause of clean air, but unfortunately at the time that the main provisions came into operation in October it was becoming apparent that there was going to be a serious shortage of solid smokeless fuels which might well affect the clean air position in this country.

As time went on, this became only too apparent and during the winter of 1969 to 1970 no less than 16 local authorities were forced to seek suspension of smoke control orders. This can only be regarded as a retrograde step and one which is very greatly deplored by this Society. That this state of affairs should have come to a head—because it had been realised for some time that such a shortage was inevitable—at a time when the Government was appointing a Royal Commission to look into the whole case of pollution and at the beginning of European Conservation Year was sad in the extreme.

In spite of reassurances from the solid fuel industry, the position has not improved and indeed in the winter of 1970/71 it looks as though the shortage may be even more acute. The Society have kept in close touch with the Divisional Councils on the development of this situation. Representations have been made to the Ministry of Technology and to the Ministry of Housing and Local Government and the matter was raised in the Clean Air Council.

The activities of the Society have followed the normal pattern. Membership has been maintained and the income of the Society has shown a slight increase. Nevertheless, costs have continued to rise and it has again been necessary to draw on our reserves, although some of this was necessitated by the fact that the last financial "year" lasted for 15 months.

Annual General Meeting

The annual business meeting of the Society was held in London on 25 April and this was followed by the usual luncheon. An Open Meeting was held following the business meeting at which the speaker was The Rt. Hon. Sir Derek Walker Smith, Q.C., M.P., who spoke on "Clean Air in a Changing World". The text of Sir Derek's speech was published in full in the Summer 1969 issue of "Smokeless Air".

At the Annual Meeting, the election of Sir Kenneth Hutchison, C.B.E., F.R.S., as the new President to succeed Sir John Charrington was announced. Sir Kenneth, who was closely associated with the gas industry for many years, has long had a keen and professional interest in clean air. This has been clearly indicated during his period of office.

Arnold Marsh, O.B.E.

In the last Annual Report, the retirement of Mr. Marsh after forty years service as Director of the Society was announced. It is with deep regret that in this report we have to record that Mr. Arnold Marsh died in hospital at Banstead, Surrey, on Tuesday, 3 June, 1969.

In recognition of Mr. Marsh's devoted service in the promotion of clean air and in order to keep his memory alive amongst his many friends, the Executive Council have decided that the new Clean Air Awards should be known as "The Arnold Marsh Clean Air Awards".

Arnold Marsh Clean Air Awards

Starting in 1970, it has been decided that the Society will make awards every two years for contributions to the cause of clean air. These awards will be made to individuals, industry and local government authorities.

The awards will take the form of a medal to all three classes, a plaque of the emblem of the Society for use by local authorities, and a suitable emblem for use on stationery by industries.

The first awards which will be a fifteen year period, will be presented at the Society's Conference in Southport in October 1970.

The Annual Conference and Exhibition

The Annual Conference and Exhibition were held at Eastbourne from 21-24 October. Eastbourne was extremely hospitable and the weather was truly magnificent. The Conference was successful but there were reports that in some instances it was too technical in content for all our members. Note has been taken of this and efforts will be made to keep to a more balanced programme and so please more people—in future.

Mr. J. P. W. Mallalieu, M.P., the then Minister of State of the Ministry of Technology, had agreed to open the Conference, but due to last minute Government changes his place was taken by Lord Delacourt-Smith, who in his opening address spoke of the progress in clean air and the Government's future intentions regarding pollution. The full text of his address was published in the Winter 1969 issue of "Smokeless Air".

On the Tuesday afternoon there was an innovation in the form of an Open Session to which members of local organisations from Eastbourne and its immediate surroundings were asked. In all, some 500 attended. Again, Government business intervened. Originally it had been planned that this Open Session would be addressed by the Baroness Serota, J.P., Minister of State, the Department of Health and Social Security. Unfortunately, she was unable to speak because of the pressure of Government business. This was undoubtedly a great disappointment to the 500 or so ladies and gentlemen—mostly ladies—who had come to hear her. Lady Serota's place was taken by Mr A. S. Marre, C.B., the Second Permanent Under-Secretary of the Department of Health and Social Security who delivered Lady Serota's address. This was also published in the Winter 1969 number of "Smokeless Air". Despite the disappointment at Lady Serota's absence, it was clear that this Open Session was a great success and it has been decided to continue with a similar session at this year's Conference in Southport.

The Wednesday forenoon session dealt with the pottery and clay industry, and papers were given on "Outstanding Air Pollution Problems in the Heavy Clay and Refractory Industry" by Mr. E. Rowden of the British Ceramic Research Association and "The Pottery Industry's Contribution to Clean Air" by Mr. W. H. Holmes also of the British Ceramic Research Association. On the Thursday morning Mr. P. Sutton of the Esso Petroleum Co. Ltd. gave a paper on "Air Pollution Control in Oil Refining" and Mr. H. I. Fuller also of the Esso Petroleum Co. Ltd. spoke on "Sulphur Oxides and Oil Fuels". After lunch Dr. A. E. Martin of the Department of Health & Social Security and Mr. R. E. Waller of the Medical Research Council presented their paper on "Clean Air and Health in London". The Conference closed on the Friday morning with papers dealing with the cement, and iron and steel industries. Mr. E. Burke of the Associated Portland Cement Manufacturers Association spoke on "Dust Control in the Cement Industry"; Mr. P. A. Matthews, a member of the Board of the British Steel Corporation, presented a paper on "Iron and Steel—Progress Towards Clean Air—A Review of Progress", and Mr. J. H. Flux of the British Steel Corporation presented a paper on some of the practical problems.

Reference has been made earlier in this report to the shortage of solid smokeless fuel and this subject was very much in the minds of many delegates while Conference was proceeding. It is, therefore, not at all surprising that at the end of business on the Friday morning, Conference passed the following resolution:—

> "That in view of the apprehension and unease represented to the National Society for Clean Air, this Conference urges Her Majesty's Government to ensure that the necessary supplies of solid smokeless fuel are available for existing and projected smoke control areas."

Conference also decided that the Society's concern regarding pollution from road vehicles should be kept before the Minister of Transport and accordingly passed a further resolution which reads:—

> "That this Conference again urges Her Majesty's Government to introduce legislation in the immediate future to set suitable limits on the emission of carbon monoxide from petrol engined vehicles and smoke emission from diesel road vehicles in accordance with the practical and relatively simple technics now available to British industry."

Council and Committees

The executive Council at its first meeting after the Annual General Meeting, elected as its new Chairman, Dr. W. C. Turner, who succeeded Mr. A. C. Saword after the usual two-year term of office. The thanks of the Council were expressed to Mr. Saword for the work which he had accomplished not only in his term of office as Chairman of the Council but also during his long association with the Yorkshire Division. The Senior Deputy Chairman, Mr. S. Cayton, was re-elected, and the new Deputy Chairman chosen was Mr. W. Combey.

The Council and its five committees met regularly during the year.

The Parliamentary and Local Government Committee have been very concerned about the shortage of solid smokeless fuel and have kept in very close touch with the Divisions of the Society with regard to this. The Conference Committee have been kept busy, not only with the arrangements for our own Conference and Exhibition, but also with those for the Second International Clean Air Conference and Exhibition to be held in Washington, D.C., U.S.A., in December 1970.

The General Purposes and Finance Committee have been fully occupied with the management and finance of the Society, always exacting tasks and because of the expiry of the lease on the Society's present offices, have been very busily engaged in arranging for the new premises. The Technical Committee has dealt with a variety of technical matters but once again has been very fully occupied with furthering the Society's policy regarding pollution from road vehicles. The Publicity Committee spent much time on a scheme for Clean Air Awards, details of which were announced during the period under review, and in finding a new, up-to-date emblem for the Society.

In December 1969 the Council decided to appoint a Steering Committee to consider the future of the Society, with the following terms of reference: —

(a) To consider the aims and policies of the Society required to meet changing conditions.

(b) To examine the organisation of the Society and its finances, its Council, Committees and staff and to make recommendations accordingly.

The Society have been fortunate in obtaining the services on the Steering Committee of Mr. H. Barry, O.B.E., of Shell Mex and B.P. Ltd., Mr. H. G. T. Busby of Lodge Cottrell Ltd. and first Mr. J. H. Flux and later Mr. G. E. Speight of the British Steel Corporation, together with those of Dr. W. C. Turner, Mr. S. Cayton, Mr. J. Clancey and Mr. S. E. Cohen. The Committee has met on five occasions so far and is well launched into its important task.

The Divisions

As the reports published throughout the year in "Smokeless Air" have shown, the Divisions have continued to be active. Indeed, there have been distinct signs of renewed activity in all Divisions. This is a most heartening sign and one which we all hope will be continued. The strength of any organisation is in its limbs; it is to be hoped that our limbs will continue to grow stronger and to exert their influence throughout the country in local affairs.

Publicity and Public Relations

Conservation Year 1970 has resulted in the subject of clean air receiving enormous publicity along with the other environmental problems. Publicity obtained for the Society itself was good for the whole year (520 press reports directly referring to NSCA), although the 1969 Conference and Exhibition did not receive as good a press as it had done sometimes in the past, possibly because of the predominantly technical nature of the papers.

There has been a great increase in the demands for the Society's library and information services during the year from the press, schools, industry and private individuals in this country and overseas.

There has also been a much greater demand for the Society's participation in other events.

The new modular exhibition and display material has been in constant use all over the country to very good effect. Indeed over 23 requests for the use of this display material were received in the first three months of 1970.

The Director has taken part in a number of television and radio broadcasts in this country, for Sweden and for the United States of America. A number of papers have been presented at various conferences in connection with clean air, the most notable of which was probably the Director presenting a paper on this subject to the British Association at their meetings in Exeter in September 1969. This paper drew a large amount of press comment and gave the Society considerable publicity. Further, there has been a constant demand for lectures on clean air to societies, large and small, of various kinds in many parts of the country.

Sales of literature and posters have shown a very healthy increase during the period under review.

Staff

Mr. Eric Hughes entered the service of the Society as Exhibition Officer in February 1969.

Mr. A. A. Mister, Assistant Secretary, left the employment of the Society in January 1970 after seven years service.

Field House,
Breams Buildings,
London, E.C.4.
April 1970.

Signed by W. C. TURNER, *Chairman*
STANLEY E. COHEN, *Treasurer*
P. G. SHARP, *Director*

NATIONAL SOCIETY FOR CLEAN AIR

(Limited by Guarantee—Incorporated 1 January, 1958)

Balance Sheet as at 31 March, 1970

1968 £		£	£
	GENERAL FUND		
18,766	Balance at 1st January, 1969	17,726	
	Add: Profit on sale of investments ..	877	
		18,603	
1,040	*Less:* Deficit for the period	8,275	
17,726			10,328
	PREMISES RESERVE FUND		
4,667	Balance at 1st January, 1969		4,667
	JOHN STANLEY SEVERS LEGACY FUND		
1,187	Balance at 1st January, 1969	187	
1,000	*Less:* Transfer to Information and Publicity Services Account	187	
187			—
22,580			14,995
	CURRENT LIABILITIES		
2,065	Sundry Creditors and Accrued Expenses	3,844	
408	Bank Overdraft	1,231	
2,473			5,075
£25,053			£20,070

1968 £		£	£
	FIXED ASSETS		
—	Office Equipment and Furniture *Note:* Records are not available to show the original cost price.		Not Valued
	INVESTMENTS AT COST		
4,149	Government and Corporation Stocks ..	1,415	
3,270	Other Fixed Interest Stocks	3,270	
13,643	Ordinary Shares	11,741	
21,062			16,426
	(Market Value 31.12.1968, £30,292)		
	(Market Value 31.3.1970, £20,584)		
	CURRENT ASSETS		
240	Stock of Posters, Charts, etc., at valuation	152	
3,333	Sundry Debtors and Prepayments ..	3,078	
363	Bank Balance—Deposit Account ..	382	
—	—Current Account ..	—	
55	Cash in Hand	32	
3,991			3,644
25,053			£20,070

STANLEY E. COHEN, *Honorary Treasurer*
P. G. SHARP, *Director and Secretary*

REPORT OF THE HONORARY AUDITORS TO THE MEMBERS OF THE NATIONAL SOCIETY FOR CLEAN AIR

We have examined the above Balance Sheet and annexed Income and Expenditure Account. In our opinion the accounts comply with the Companies Acts, 1948 and 1967 and give a true and fair picture of the state of the Company's affairs at 31st March 1970 and of its deficit for the period ended on that date.

GEO. LITTLE, SEBIRE & CO., *Chartered Accountants,*
Adelaide House, London Bridge, London, E.C.4. *Hon. Auditors*

Income and Expenditure Account for period 1 January, 1969 to 31 March, 1970

1968 £	EXPENDITURE	£	£
14,330	Salaries and Wages	19,472	
521	Staff Pension Scheme	882	
2,081	Rent, Rates, Light and Heat	2,671	
2,873	Travelling, Insurance, Cleaning and General Expenses	3,882	
357	Office Equipment and Furniture ..	282	
722	Stationery and Supplies	790	
20,884			27,979
	Smokeless Air and Year Book:		
4,049	Printing, Postages, etc	5,564	
3,835	*Less:* Receipts from Advertising ..	4,017	
214			1,547
	Information and Publicity Services and Cost		
1,888	of Publications	3,402	
1,000	*Less:* Amount Paid from John Stanley Severs Legacy (final)	187	
888			3,215
624	Divisional Grants		542
	Dusseldorf Joint Venture		
	Expenditure including deposits .	2,193	
	Less: Income including deposits recovered	2,083	110
£22,610			£33,393

1968 £	INCOME	£	£
16,590	Subscriptions and Donations		18,961
4,483	Conference Fees	5,482	
3,236	*Less:* Expenses..	2,878	
1,247			2,604
8,393	Exhibition Income	4,933	
7,189	*Less:* Expenses..	4,910	
1,204			23
1,127	Sales of Publications		1,990
	INVESTMENT INCOME		
1,042	Taxed Dividends (Net)	1,239	
340	Income Tax Repayment..	282	
20	Bank Deposit Interest	19	
1,402			1,540
21,570			25,118
	EXCESS OF EXPENDITURE OVER INCOME		
1,040	Transferred to General Fund		8,275
£22,610			£33,393

Divisional Reports

Northern Ireland Division

The Annual General Meeting of the Division was held in the offices of the Coal Advisory Service, 87 Eglantine Avenue, Belfast, on Thursday 2 January, 1969. Mr. R. Campbell Brown, Technical Director, Davison & Co. was re-elected Chairman and Mr W. Jenkins, Chief Public Health Inspector, City of Belfast, was re-elected Deputy Chairman.

Mr. D. G. Barrett, B.Sc., General Manager of the Coal Advisory Service addressed the meeting and discussed the implications and operation of the Clean Air Act, 1964, making special reference to the position of elderly people living in smoke control areas. Mr. Barrett paid tribute to the manner in which the various fuel interests had accepted their responsibilities under the Clean Air Act.

The main event of the year was the Spring Meeting held in the Town Hall, Bangor, on 15 May. The record attendance was most encouraging. The Papers presented by Dr. S. A. Craxford, Head of the Air Pollution Division, Warren Springs Laboratory, Ministry of Technology, Stevenage, and Mr. K. H. Lynas, Chief Public Health Inspector, Ministry of Health and Social Services were not only very interesting but relevant and of practical value. An open forum arranged for the afternoon session was of special interest to those present. Many relevant questions were asked and answered by the representative panel of speakers. It was a great pleasure and delight to have with us on this occasion the President and the Honorary Secretary of the Scottish Division. Rear Admiral P. G. Sharp, Director of the National Society was also able to be with us on this occasion and take part in the meeting.

Much of the success of the Spring Meeting was due to the excellent arrangements made by the Bangor Borough Council and their Officers and we are most grateful to his Worship the Mayor, Councillor R. V. Campbell for the generous hospitality provided and his kindly interest in our affairs.

Progress continues to be made in smoke control and during the year a number of Smoke Control Orders were made and confirmed. More local authorities are getting getting involved in smoke control work and it is hoped that this trend will be contined. Attention has been drawn to the desirability of making new housing developments, both public and private, subject to Smoke Control Orders.

Arrangements have been made for the 1970 Autumn Meeting to be held in Belfast on 30 October.

W. E. C. O'BRIEN, *Hon. Secretary*

North East Division

During the year 1969 the Division held two meetings. The first was the Annual General Meeting which was held on the 23rd April, 1969, at the Miners Welfare Institute, Washington, Co. Durham. After being received by the Chairman of the Washington U.D.C., members were conducted round a group heating scheme in Washington, where three coal-fired boilers provided the heat for 620 dwellings in multi-storey blocks. After lunch, which was provided at the kind invitation of the National Coal Board, Mr. L. V. Penzer, the Deputy Regional Marketing Director of the National Coal Board, headed a symposium entitled "The Smokeless Use of Coal". Mr. Penzer was supported by a panel of experts comprising representatives of the C.U.C., of the Associated Heat Services, the S.S.F.F., and the Coal Merchants' Federation.

During the course of his address Mr. Penzer emphasised that the N.C.B. and the coal industry supported the clean air movement without qualification and referred to the development of district heating in Washington and other places as evidence of this. The speaker's address ranged over a wide field of topics which emphasised the smokeless use of coal, but his principal remarks related to the Felling experiment where 158 houses were being supplied with pre-determined quantities of premium fuel in an endeavour to ascertain what increase, if any, in the cost of housing heating would be occasioned by the use of a particular premium fuel in place of Gloco. The experiment was designed to determine costs, acceptability by householders and the efficiency of the premium fuels. At the time of the meeting the collation of statistics had not been completed. During the course of the business meeting at which the Chairman, Vice-Chairmen, Honorary Secretary and Treasurer and Honorary Auditor were re-elected, the Chairman in his annual address made special reference to the disappearance of Gloco from existing smoke control areas which would give rise to a situation of grave anxiety before the ensuing winter is out.

A gratifying feature of this meeting was the presence of the Director and Secretary of the Society, Rear Admiral P. G. Sharp, particularly as the former Director, Mr. Arnold Marsh, had attended the previous meeting a year earlier.

On 1 December 1969 the second meeting of the Division was held in the Department of Civil Engineering in the University, Newcastle upon Tyne, when a total of 39 members attended. The purpose of the meeting was to consider the increasing importance of, and problems arising in connection with, grit and dust arrestation and the provisions of the Clean Air Act of 1968. The Chairman, Alderman B. N. Young, O.B.E., called upon Mr. W. Short. B.Sc., M.Inst.F., A.M.I.H.V.E., M.I.NuclearE., Area Manager of the North West Area of the National Industrial Fuel Efficiency Service, to deliver a paper entitled "Grit and Dust—Measurement and Control. The Role of the Local Authority". Mr. Short outlined the major changes brought about by the Clean Air Act of 1968 and with the aid of projected slides showing graphs, drawings and photographs, he described the various methods of grit and dust arrestation both in Britain and on the Continent. He made particular reference to the fall-out of particulate material of different sizes from chimneys of varying heights and commented on the Clean Air (Arrestment Plant) (Exemptions) Regulations, 1969. This address was followed by a lively discussion in which most members took part and after light refreshments members dispersed.

Undoubtedly the most pressing problem at the end of the year was the Gloco crisis and it was particularly unfortunate that it was only those forward-looking and energetic local authorities who had pursued a smoke control policy with vigour since the Clean Air Act 1956 was in operation who would now be suffering the greatest penalty because of their progressive attitude. Laggard authorities who began smoke control after the open fire was abandoned are not affected by the Gloco situation and all in all the present difficulties which clearly have arisen because of a lack of a realistic fuel policy have had a most discouraging effect on most North Eastern local authorities.

Throughout the year enquiries were received from members of the public and local authorities on questions relating to smoke control and clean air policy generally and it was gratifying to note that public opinion in the North East had markedly changed during the past few years and that no serious opposition now exists. From time to time information was sought by your Honorary Secretary from Chief Public Health Inspectors and others in the North East on matters relating to air pollution control and the opportunity is taken in this report to express thanks for this ready assistance.

L. MAIR, *Hon. Secretary.*

North West Division

The Annual General Meeting of the North West Division was held at the Manchester Racecourse, Salford, on 27 March, 1969. Members were entertained to luncheon by the National Coal Board.

The Divisional Council met on three occasions during the year and at the first meeting held at the Gas Board Showrooms, Piccadilly Plaza, Manchester, on Thursday, 22 May, 1969, Mr. F. Winder, Chief Public Health Inspector, Stockport C.B.C., was elected Chairman. Mr. R. W. Hollindale of the North Western Gas Board was elected Vice-Chairman. Mr. H. Clusky was elected Hon. Treasurer of the Division and Mr. W. E. Pollitt was elected Hon. Secretary.

As in the previous year, much time has been devoted in promoting a further competition to publicise the need for Clean Air. A Publicity Sub-committee formed for this purpose has met on several occasions and the scheme is now being finalised. It will be completed in time for the Clean Air Conference at Southport 1970.

During the year under review the Society has, in the North West Division, provided Speakers to Women's and Men's Guilds, assisted in G.C.E. Courses at schools and Colleges of Further Education; also an article on Clean Air was produced for a monthly magazine "Harvest".

The progress in the Division by Local Authorities in the "black areas" is continuing, although the threatened shortage of solid smokeless fuels in the winter of 1971 must give rise to concern to all members of the Society. Any easing of our efforts now would be a grave mistake from which the Clean Air Movement would never recover. Now is the time when all who are keenly interested in cleaning the atmosphere in this year of Environmental Conservation, should persist in their efforts and insist that all who are concerned with the provision of smokeless fuels should ensure that there are adequate supplies, irrespective of any political or economical circumstances.

W. E. POLLITT, *Hon. Secretary*

Yorkshire Division

The Council of the Yorkshire Division of the National Society for Clean Air met on four occasions during 1969.

On 3 March it met at the National Coal Board, Manvers Extended Laboratory, Wath-upon-Dearne at 10.45 a.m. and heard an illustrated lantern lecture on the new "Housewarmer" appliance given by Mr. John L. Ball, Heating Consultant, Coal Research Establishment, Stoke Orchard. It was claimed that the appliance was designed to burn high-volatile coal smokelessly and at that time it was hoped and expected that the "Roomheater" would be added to the list of domestic approved appliances approved for use in Smoke Control Areas.

The Council met on 24 June for a formal meeting at Monk Fryston Hall at 10.15 a.m. Among the matters discussed was the question of prosecuting coal merchants delivering coal in Smoke Control Areas and the way in which local authorities could collaborate with coal merchants to prevent offences occurring unwittingly. Mr. Eastwood raised the question of a possible shortage of fuel in the coming winter. The meeting then had a talk on Glogas Liquefied Gas Service by Mr. Laycock of the North Eastern Gas Board, and in the afternoon the Council visited the Thorpe Willoughby Estate where a complete heat service is provided by Glogas.

At 10.15 a.m. on 16 September the third Council Meeting was held in the Conference Room at the Eggborough Power Station. Talks were given by Mr. J. Watts, Leeds Area Commercial Officer of the Yorkshire Electricity Board on "The Domestic Uses of Electricity" and by Mr. R. Wolforth of the Central Electricity Generating Board on "Electricity Generating". In the afternoon the Council had a limited conducted tour of the new Eggborough Power Station.

On 15 November, at the invitation of the Coal Utilisation Council the Divisional Council attended a meeting held at the Heating Centre, 9 Wellington Street, Leeds at 11.15 a.m. Mr. Mark Andrew, Director of the Yorkshire and Humberside Clean-up Campaign, attended to outline the aims and object of his campaign and the possibility of co-ordinating it with the work of the National Society for Clean Air. At this meeting provisional arrangements were made for a joint open meeting of all members representing the National Society for Clean Air and the West Riding Air Advisory Council, to hear a paper to be given by Mr. Perry at the Civic Hall on the subject of The Clean Air Act, 1969. In the afternoon there was a special meeting at which informal discussions took place with regard to the difficulties and the problems experienced in supplies of solid smokeless fuel.

Detailed reports of clean air progress were submitted to the Council by Mr. A. W. Perry (Halifax), Mr. A. G. Saword (Kingston-upon-Hull), Mr. James Goodfellow (Leeds), Mr. J. W. Batey (Sheffield) and Mr. W. B. Twyford (Wakefield).

The present membership in the Yorkshire Division is as follows:

	1969	*1968*
Individual members	27	31
Corporate or Institution members	18	18
Local Authority members	66	66
Associate members	6	6

JAMES GOODFELLOW, *Hon. Secretary*

West Midlands Division

Two excellent meetings were held during 1969; the first in April, by the kind co-operation of the National Coal Board, took the form of a symposium dealing with the contribution which the solid fuel industry can make to the cause of Clean Air. The district heating film ‘ Objectif Chaleur ’ was shown; this film was introduced by Mr. D. M. Willis of the National Coal Board. Following upon this Mr. Dulson and Mr. Shillingford dealt with the solid fuel supply position and solid fuel appliances. There was then a break for lunch, kindly provided by the National Coal Board. This was followed by the formal business of the Annual General Meeting, at the conclusion of which there was a technical discussion on solid fuel problems introduced by Mr. H. V. Cranham, with the closing address by Mr. W. Dulson. Each member present was supplied with a quantity of the Coal Board's solid smokeless fuel for practical trial.

The Autumn Sessional Meeting was held at Leicester, when the opportunity was taken to visit the District Heating Scheme at Rowlatts Hill. Here again the National Coal Board very kindly provided hospitality. The undoubted success of this meeting was due to the excellent co-operation which we received from the National Coal Board and the Leicester City Council.

The National Coal Board were particularly helpful in providing photographic material which, in turn, provided excellent publicity. In this latter connection the Division are greatly encouraged by the cover provided by the Press within the Division.

Items of particular interest dealt with by the Divisional Council during the year were Grit and Dust Measurement; The Statutory Instrument. Clean Air (Emission of Dark Smoke) (Exemption) Regulations, 1969; Noise from Fan Units and the shortage of Solid Smokeless Fuels.

W. L. KAY, *Hon. Secretary*

East Midlands Division

At the beginning of 1969 there appeared to be some evidence that local authorities in the East Midlands Division and in the Black Areas generally, were responding to the Ministry exhortation to accelerate their Smoke Control programmes, and with the further powers included in the Clean Air Act 1968, which were designed to make existing control more effective, everything seemed to be "set fair" for a renewed attack on atmospheric pollution.

This optimism was, however, shortlived for, in parts of the country particularly in the Midlands and the North, the long severe winter which extended well into April, depleted existing stocks of smokeless fuels, and despite the assurances forthcoming from the Ministry of Housing and Local Government that adequate supplies of such fuels were available for the present and future needs of Smoke Control, complaints of shortages were being received from both fuel merchants and consumers. It would have been reasonable to expect that after the very good summer which followed, stocks of smokeless fuels would have been replenished before the onset of winter, but this was not to be the case; and it became evident in the early autumn in this Division, that a serious shortage of all smokeless fuels was developing. The shortage became so acute in the north of the Division that the fuel needs of the residents in Smoke Control Areas could not be met, and it was with the greatest reluctance that certain local authorities had to ask for the temporary suspension of smoke control to prevent serious hardship during the cold weather.

That such measures should have to be taken at this time must be a very sad commentary to those local authorities, and to the Society who have shown thtmselves to be intent upon getting rid of the evil of atmospheric pollution in the shortest possible time. The portents are, that nothing short of a National fuel policy, covering both supply and distribution of all approved fuels will be successful in preventing recurrent crises and restoring the confidence of local authorities to recommence and complete their smoke control programmes

Three meetings were held in the Division during the year. On the afternoon of the 11 March, 1969, 64 members visited the West Burton Power Station of the Central Electricity Generating Board, at the invitation of the Station Superintendent. During a tour of this 2,000 mega-watt generating station, which consumes approximately 5 million tons of coal per annum, members were particularly interested in that part of the station concerned with ash and dust extraction. A total of 950,000 tons of ash and dust are collected and disposed of annual, and so effective are the mechanical dust collectors and the electro-static precipators, that it was stated from a comparison of records taken from numerous dust gauges and volumetric gauges set up at distances of $\frac{3}{4}$ mile to five miles from the station, before and after it went into operation, revealed only a slight increase in the level of pollution.

Afterwards, tea was kindly provided by the Board and this was followed by "Question Time" when the Station Superintendent and the Scientific Officer dealt with members' questions on various aspects of air pollution from large generating stations.

The Annual General Meeting was held in Derby on 17 July, 1969, 70 members attending. For the morning session, members assembled at the factory of Messrs. Leys Malleable Castings Co. Ltd., Colombo Street, Derby, which was being revisited after a period of 11 years. In his address of welcome, J. Hill, Esq., Works Director, expressed the Company's pleasure in this revisit, for he said it would give those who were present on the last visit, an opportunity of seeing the efforts which had been made to reduce atmospheric pollution from this plant, albeit at considerable costs. He stated that modernisation and mechanisation of the factory had resulted in coal consumption being reduced from approximately 1,000 tons per week in 1958 to almost Nil in 1969, and this together with the installation of improved dust arresting equipment, at a capital cost of over £340,000, had made conditions in and around the factory more tolerable, and had met with the approval of the local authority and the nearby residents.

Members were then taken on a conducted tour of this very extensive factory, in which 2,300 tons of iron are melted each week in the production of malleable castings, largely for the motor industry. The comparative absence of dust and fume in the melting and annealing departments since electricity and gas had replaced pulverised coal in the heating of the furnaces, was most noticeable and demonstrated the success of the Company's efforts in overcoming the serious atmospheric pollution problems invariably associated with this industry.

After a most interesting tour of the factory, members were entertained to lunch at the kind invitation of the Directors of the Company.

In the afternoon, the Annual General Meeting was held in the Council Chamber of the Council House, Derby, at the kind invitation of the Mayor and the County Borough Council, a civic welcome being extended to members by Her Worship the Deputy Mayor of Derby, Alderman Mrs. E. Wood.

Opening the Meeting, the Chairman, Councillor F. Brothwell, referred to the death of Mr. Arnold Marsh, the late Director of the Society, and paid tribute to his life's work in the cause of clean air, which had earned for him an international reputation in this field.

The officers elected for the ensuing year were as follows:

Chairman: Councillor J. H. Gregory, Southwell R.D.C.
Deputy Chairman: A. Wade, Esq., M.B.E.
Honorary Secretary: Mr. G. Drabble (re-elected).

Following the business meeting, the Chairman, Councillor J. H. Gregory, introduced Mr. B. Willison, Assistant Maintenance Engineer to Messrs. Leys Malleable Castings Ltd., who gave an illustrated address on the subject of "Prevention and Control of Atmospheric Pollution from large Foundries", with particular reference to the Messrs. Leys factory visited earlier in the day.

At the close of the Session, members were entertained to tea at the invitation of the Mayor and the Derby County Borough Council.

On 25 September, 1969, the East Midlands Division went beyond its own boundary to visit Sheffield at the invitation of the Lord Mayor and the City Council. Sixty-four members were received at the Town Hall by members of the City Council and officials, after which they were conveyed by coaches on a tour of the City to the see the truly remarkable effect of the progressive domestic smoke control policy pursued by the City Council during the last 10 years.

Returning to the Town Hall, members were given a civic reception and entertained to luncheon by the Right Worshipful, the Lord Mayor of Sheffield, Alderman D. J. O'Neil and the Lady Mayoress.

In the afternoon, Mr. J. Batey, the Superintendent Smoke Inspector of the City of Sheffield, in a most interesting and informative address, explained the progress made in the City in the reduction of atmospheric pollution from both industrial and domestic sources.

G. DRABBLE, *Hon. Secretary*

South East Division

The interest in the Society was maintained by three meetings of the Divisional Council, one general meeting and the Annual General Meeting.

At a meeting of the Divisional Council in May a discussion took place concerning the part which divisions play in the Society and their relationship to each other and to Headquarters. Suggestions were put forward for consideration by the Director.

The general meeting was arranged through the hospitality of Motherwell Bridge Tacol Limited which consisted of a film show of large-scale incineration plants for household refuse and the treatment of abandoned motor cars. This proved of great interest.

After the Annual General Meeting a symposium on "Pollution from Road Vehicles" was held and this has already been reported on in the winter edition of Smokeless Air.

During the year four visits of interest were arranged as follows:

> The North Thames Gas Board's Methane Terminal at Canvey Island, when members saw the storage and unloading facilities and were given a talk on that and the conversion of appliances to Natural Gas.
>
> British Leyland Motor Works, Oxford, when the methods of preventing air pollution from a large motor works were seen.
>
> Shell Mex oil refinery at Shell Haven where a tour of the refinery was made.
>
> National Coal Board Housewarmer appliances at a house at West Hampstead where two separate parties saw the fireplaces in operation.

The grateful thanks of the Division are due to the organisations who allowed the visits to take place, for the hospitality provided and to their staffs who so ably assisted in making the visits so enjoyable and useful.

Owing to his forthcoming retirement from Local Government service Mr. John Hodgins, who had been Honorary Secretary for six years, tendered his resignation as from the Annual Meeting. The Division benefited greatly from his period of office and now take the opportunity of thanking him for his interest and work as well as to wish him a happy and long retirement.

R. F. SHAPTER, *Hon. Secretary*

South West Division

Three meetings of the Division, four meetings of the Divisional Council and one meeting of the Northern Area Committee were held during the fifteen months from the 1st January, 1969, to the 31st March, 1970.

The 1969 Annual General Meeting was held in March at the University of Bristol, when the Division's new Chairman, Alderman C. Hebblewhite, C.B.E., Chairman of the Social Services Committee of the Bristol City Council, was elected unanimously. A paper was given by Mr. G. F. Downing (Deputy Chief Public Health Inspector, Bristol) on the Clean Air Act, 1968, with particular emphasis given to the control of chimney heights under Section 6. Representatives of the Bristol and Somerset Planning Authorities attended the meeting and a very full discussion ensued. Concern was expressed at the inadequacy of chimney height control where an existing boiler is replaced by one of a higher output, both in terms of steam and sulphur dioxide, but a smaller combustion space. The wording of Section 6 (10) (c) provides no control over the situation and it is in fact possible to discharge an appreciably larger quantity of sulphur dioxide through an already inadequate chimney.

The Divisional Council meeting in July discussed the future activities and it was agreed that three meetings of the Division should be held each year. The District Heating Association held a conference and exhibition in Bristol during September 1969 and the National Society provided an information stand at the exhibition which was manned by members of the Division; a paper on district heating and air pollution being given by Mr. Alan Mister. The theme of district heating was maintained and was the subject of the next meeting of the Division in December. This was held at Yoevil, and papers on district heating were presented by Messrs. R. Uden and R. J. Staley of Shell-Mex and B.P. Limited. This talk was followed by a visit to a district heating scheme serving a privately developed housing estate of some seventy houses in rural surroundings at South Petherton.

The Northern Area Committee of the Division met in January 1970, and the problem of air pollution arising from the Avonmouth/Severnside industrial complex was discussed. It was agreed in principle to explore the possibility of establishing a liaison committee which would consist of representatives of the major industries in the area and the relevant Planning Authorities in addition to members of the Northern Area Committee. A further meeting has been arranged for May in order to take these proposals a stage further.

The 1970 Annual General Meeting was held at the Council House, Bristol, on the 5th March, and the Division was honoured with the visit of the Director, Rear Admiral P. G. Sharp, C.B., D.S.C., and Mrs. Sharp. The Lord Mayor entertained the Director and his wife, the speaker for the afternoon meeting and officers of the Division to an official luncheon. The Director in his address to the meeting reviewed progress made with clean air in this country and gave his personal views on the future role of the National Society. The other speaker was Dr. G. Nickless of the School of Chemistry, University of Bristol, who has travelled in the United States of America on a Winston Churchill Foundation grant in order to study pollution. He was interested in the wider aspects of pollution and particularly the problems associated with odours, the flow and dispersal of air contaminants. the effects of air pollution on both live and inanimate objects and the various problems associated with the detection and measurement of air pollution. He went on to review the serious problems experienced in the United States and stated that it was acknowledged that the British were well in advance in dealing with air pollution problems. He also regarded as of considerable importance the lack of control over nitrogen oxide and lead in the atmosphere. Dr. Nickless welcomed the growing tendency to stop the use of lead additives in petrol. A number of members took part in the discussion following the paper and the strong support for the control of pollutants from motor vehicles was voiced.

Serious concern was expressed by members regarding the shortage of solid smokeless fuels and the effect of this on progress with smoke control in the region.

During the period under review our representation on the National Executive was increased with the co-option of Mr. Philip Draper and a delegate, the first for some years, was sent to the Annual Conference at Eastbourne. It can be seen that this has been a time of considerable activity in the Division. It has been a full and successful year and the Division can look forward to the coming year with confidence.

G. J. CREECH, *Hon. Secretary*

South Wales Division

Two meetings of the Division were held during the year. The first meeting at Aberthaw Power Station being very well attended. The second meeting was held at the Llanwern Steelworks, British Steel Corporation, Newport. This turned out to be the best attended meeting that has been held in the Division for a number of years. Fifty-six members were addressed by Mr. A. Pearson, Fuel Technologist, who discussed fully, flue gas cleaning from LD Furnaces and measures adopted by the Division to minimise pollution to the atmosphere.

After a very interesting talk, Mr. Pearson answered the many varied questions put to him, members were then transported on a very full visit of the plant with special emphasis being paid to the LD Furnaces grit and dust collecting equipment. Members then adjourned to the Staff restaurant for tea.

The thanks of the Division were accorded to Mr. Pearson and the Public Relations Officer, Mr. Williams for the very interesting and educational meeting, and to the Company for the much appreciated refreshments.

L. MORGAN, *Hon. Secretary*

Scottish Division

During 1969, there were three meetings of both the Division and the Executive Committee. The main event of the year was the Annual General Meeting and Conference of the Division which were held in Largs from 21st to 23rd May. The conference was well attended and the papers, some of which were reported in the Autumn issue of Smokeless Air, were well received.

The President and Hon. Secretary, at the invitation of the Northern Ireland Division, attended the Spring Meeting of that Division in Bangor, County Down, on 15th May, and a similar invitation was extended to the President and Hon. Secretary of the Northern Ireland Division to attend the conference at Largs.

The Government's restrictions on local authority expenditure during 1968 undoubtedly had an effect on the progress of clean air in Scotland and some authorities stopped their clean air programmes. However, some of these authorities have now restarted their programmes, although there are those which have taken little or no action. The Division are more than a little disturbed at the apparent disinterest on the part of some local authorities, and it is hoped that the exhibition which the Division is staging in Glasgow in 1970 will encourage these authorities to take some action.

The 54th Annual Winter Session of the classes for firemen, boiler attendants, engineers, etc., which are organised under the joint auspices of the Division and the Health and Welfare Department of the Corporation of Glasgow, commenced in October. Ordinary and advanced classes are held and both are very well attended.

During the year, Mr. J. W. Traill, who had been Honorary Secretary and Treasurer of the Division since 1962, resigned. The Division wish to record their appreciation of the services rendered by Mr. Traill.

In view of the reported shortages of solid smokeless fuel, the Division made representations to the Scottish Development Department regarding the closure of the gas works with the result that gas coke would no longer be available. It is understood that the Department have this matter under consideration.

H. J. FEELEY,
Hon. Secretary and Treasurer

Information About the Society

The forerunners of the Society were the Coal Smoke Abatement Society, established in London in 1899, the Smoke Abatement League of Great Britain (1909) concerned mainly with the Provinces and the National Smoke Abatement Society, formed in 1929 by the amalgamation of the two parent organisations. At a Special General Meeting held in April 1957, it was agreed unanimously to change the name of the Society to "National Society for Clean Air", and to seek incorporation as a company limited by guarantee, a licence being sought from the Board of Trade to omit the word limited. The Society assumed its new name and status as from 1st January, 1958. For futher information about membership, Executive Council and Committees, etc., reference should be made to the Society's Memorandum and articles of Association and Byelaws.

Divisions

For electoral purposes and where it is desired, area organisation, the Society is now composed of the following geographical Divisions: (1) Scotland, (2) Northern Ireland, (3) North West, (4) North East, (5) Yorkshire, (6) West Midlands,, (7) East Midlands, (8) South West, (9) South East, (10) South Wales and Monmouthshire. (See Byelaws for the Counties in each Division.)

Membership

The Society is wholly dependent on the contributions of its members for the growth and the maintenance of its work, and invites the support of all who sympathise with and wish to promote its objects. These are stated in full in the Memorandum of Association, but they may be briefly summarised as the securing throughout the United Kingdom of the maximum of natural light and air free from every form of pollution, particularly that arising from the combustion of fuel. There are three main classes of membership—for individuals, local authorities, and corporate bodies such as firms, public undertakings and institutions. Individual members and the representatives of other members have rights of nomination and voting in elections for Officers and Council. They receive, free of charge, the Society's quarterly journal *Smokeless Air* and other publications. Local authority and corporate full members are also entitled to receive one *extra* copy of *Smokeless Air* and the Society's Year Book for each guinea by which their subscription exceeds three guineas. Corporate members who have branches or offices in Divisions of the Society other than that in which their Registered Office is situated may appoint Delegates to participate in the activities of those Divisions. Members are entitled to receive assistance and information on problems relating to air pollution. In addition to receiving notices of meetings and conferences organised nationally, they are entitled to participate in any activities organised by or within their Divison.

Associates

Any individual, local authority, instiution or corporate body contributing less than the appropriate membership subscription may become an *Associate,* entitled to some of the privileges of membership, but not to those relating to nomination, voting and election to office.

Subscriptions

Individual Members—Not less than one pound ten shillings.

Local Authority Members—Not less than the following amounts, according to population:

	£
Less than 25,000	8
25,001 to 50,000	10
50,001 to 75,000	13
75,001 to 100,000	19
100,001 to 175,000	32
175,001 to 250,000	35
250,001 to 375,000	40
375,001 to 500,000	45
500,001 and over	60

Corporate Members—Not less than thirty pounds (two representatives and two delegates in each appropriate Division), or not less than eighteen pounds (one representative and one delegate in each appropriate Division).

(Under Article 5 (e) (ii) of the Society's Articles of Association, an Association or firm which is not incorporated can appoint representatives to act on its behalf, and obtain all the benefits of Corporate Membership.)

SUSTAINING MEMBERS—A member in any class subscribing not less than £100 a year.

SPECIAL CASES—The Executive Council may consider applications for membership on special terms as to subscriptions and otherwise. This rule is intended to apply in particular to local and other small voluntary associations wishing to become Corporate Members.

ASSOCIATES—Any sum that is less than the appropriate subscription for membership.

DONATIONS—The Society will be pleased to receive single or annual donations for any amount from non-members.

PUBLICATIONS—Annual subscriptions may be made for *Smokeless Air, Clean Air Year Book* and for other publications as issued. Details of such subscriptions will be sent on request.

PAYMENT OF SUBSCRIPTIONS—The first subscription should be forwarded with application for membership. This may be sent at any time. It is mutally advantageous if subscriptions are made by Banker's Order.

COVENANT DONATIONS—Annual contributions to the society may be made under covenant, the Society being recognised as a "charity" by the Commissioners of Inland Revenue for this purpose. By signing an agreement to subscribe a stated sum for a minimum of seven years the Society may claim the amount of income tax that has been paid on such contributions, thereby increasing the benefit it receives without additional cost to the donor. Further particulars and form of covenant will be forwarded on request.

Representatives and Delegates

Local authority and Corporate Members are entitled to appoint Representatives to exercise on their behalf the rights of membership with regard to nomination for office, voting, receipt of publications, etc. Corporate Members may appoint one or two representatives each, according to subscription, and Local Authority Members a number according to population, as follows:

Less than 100,000	2
100,001 to 250,000	3
250,001 to 500,000	4
500,001 and over	5

Note: The Delegates mentioned previously participate in the activities of the Society *only* at Divisional level. A member's Representative exercises all the rights to which a member is entitled.

The names and addresses of Representatives should be forwarded on making application for membership, so that they may be entered in the Voting registered.

SERVICES TO MEMBERS

Information and Advice

Advice, assistance and information on matters relating to atmospheric pollution and its prevention is available free of charge to Members, provided that, where necessary, the request is approved by the Executive Council. If the information required is not immediately available to the Society's Information Department, the Society is prepared, on behalf of a Member, to obtain it from one of the specialised Information Bureaux.

Library

The Society's Library is available for the use of all Members. It possesses classified files of Press cuttings, and an extensive collection of both British and foreign books, reports and pamphlets on air pollution and related subjects. In some cases, the Society is the only organisation in the United Kingdom receiving the publication. Books and other publications are issued on loan, or may be consulted in the Society's offices. The Society is linked with various specialist and technical libraries, and when a publication relating to some special aspect of air pollution is not in the library, the Society can often borrow it through other sources. Applications should be made initially to the Librarian.

Lectures

The Society will be pleased to help members and others in any part of the country to arrange lectures and talks of all kinds on atmospheric pollution and related subjects. A panel of speakers, arranged regionally, is being prepared and will be supplied on request.

Films

The Society does not possess films or film strips for loan, but a comprehensive list of films available from other sources is given elsewhere in this Year Book.

Exhibitions

The Society is prepared to consider participating in suitable exhibitions, and has a mobile modular exhibition stand available for this purpose.

Publicity Advisory Service

The Society's Publicity Advisory Service is available to help Local Authorities and Corporate Members with their Clean Air Publicity, especially when Smoke Control Orders are pending.

The Service advises members on display material, its arrangement for exhibitions, stands, etc., and supplies information on other publicity activities such as public meetings, local press features and correspondence, educational work in schools, women's organisations, etc.

No charge is made for this service to members.

Exhibition Display Material

The Society has several exhibition units available for loan by local authorities and corporate members. These units are adaptable for displays ranging from 20 sq. ft. to 300 sq. ft. of floor space, and are complete with their own graphics and lighting.

Demand for these units is heavy particularly in the spring and autumn, and it is essential that enquiries are made as far in advance as possible.

A charge of £5 is made for the loan of these units plus the cost of carriage.

Posters

The Society has a number of coloured and line posters available, ranging in price from 2s. 6d. per copy (double crown) to £10 100 copies.

The full list of posters available is as follows:

1. *Clean Air is Your Affair*
2. *Prevent Air Pollution—Britain's Biggest Headache*
3. *Smokeless Zones—Cleaner Homes*
4. *Away with Smoke—Let in the Light*
5. *These are the Things that Smoke Does*
6. *Road Vehicle Pollution*

Wall Chart

For school use, 44 in. × 25 in. (7s. including Lecture Notes).

Leaflets

Inquiries are invited on the supply of publications, give-away leaflets, etc., for special purposes. Particulars of these are given below.

(1) "Descriptive Summary of the Clean Air Act," 6d. per single copy (by post 8d.) 4s. 6d. per dozen, or £1 10s. per 100.
(2) "Clean Air Begins at Home". 22s. 6d. per 100, or £9 per 1,000.
(3) "Smoke Affects Your Health & Your Wealth." 22s. 6d. per 100, or £9 per 1,000.
(4) Clean Air Bookmarks—4s. per 100, 30s. per 1,000.
(5) "The Air You Breathe".

General Publications

(1) "Smokeless Air." The Society's quarterly magazine. News, articles, photographs and comment. 20s. per annum, post free. 5s. (5s. 6d.) per copy.
(2) "Clean Air Year Book" published annually. Price 10s. (10s. 6d.).
(3) Clean Air: Notes for Teachers and Lecturers. 5s. (5s. 6d) per copy.
(4) Fumifugium 2s. 6d (3s.).
(5) Sulphur Dioxide. 3s. (3s. 6d.).
(6) Air Pollution from Road Vehicles. 3s. (3s. 6d.).
(7) Towards Cleaner Air—A Survey of Air Pollution. 3s. (3s. 6d.).
(8) The Law Relating to Air Pollution —a summary of legislation. 3s. (3s. 6d.).

Photographs

The Society has a classified and indexed collection of smoke and other photographs, which are suitable for reproduction and/or exhibition purposes.

New photographs of high pictorial quality, in colour and covering a wide range of air pollution control subjects have now been acquired by the Society. Prints may be inspected at the Society's offices, or a selection will be sent by post if details of requirements are given. The copyright in the photographs is retained by the photographer, and where reproduction fees are chargeable, the inquirer should communicate with the photographer.

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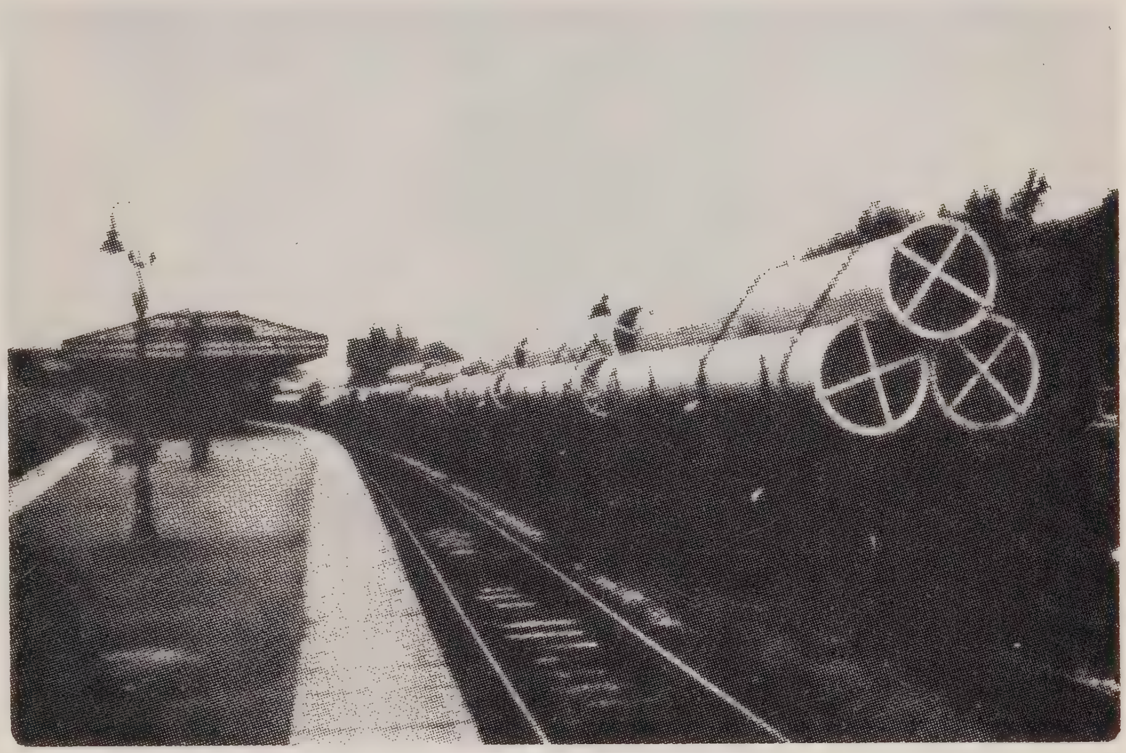

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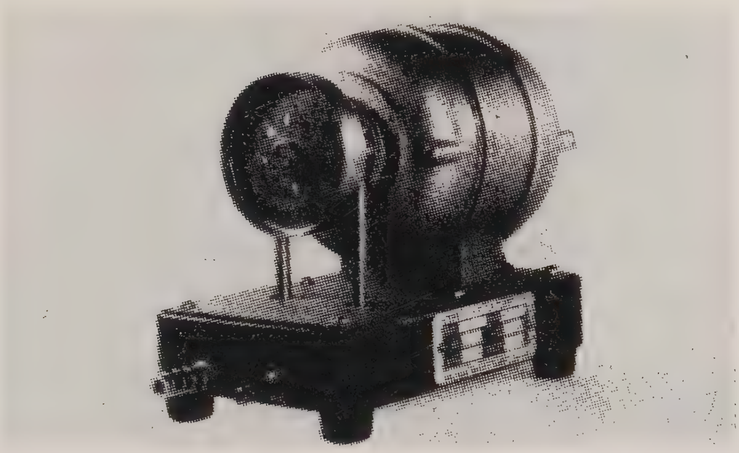

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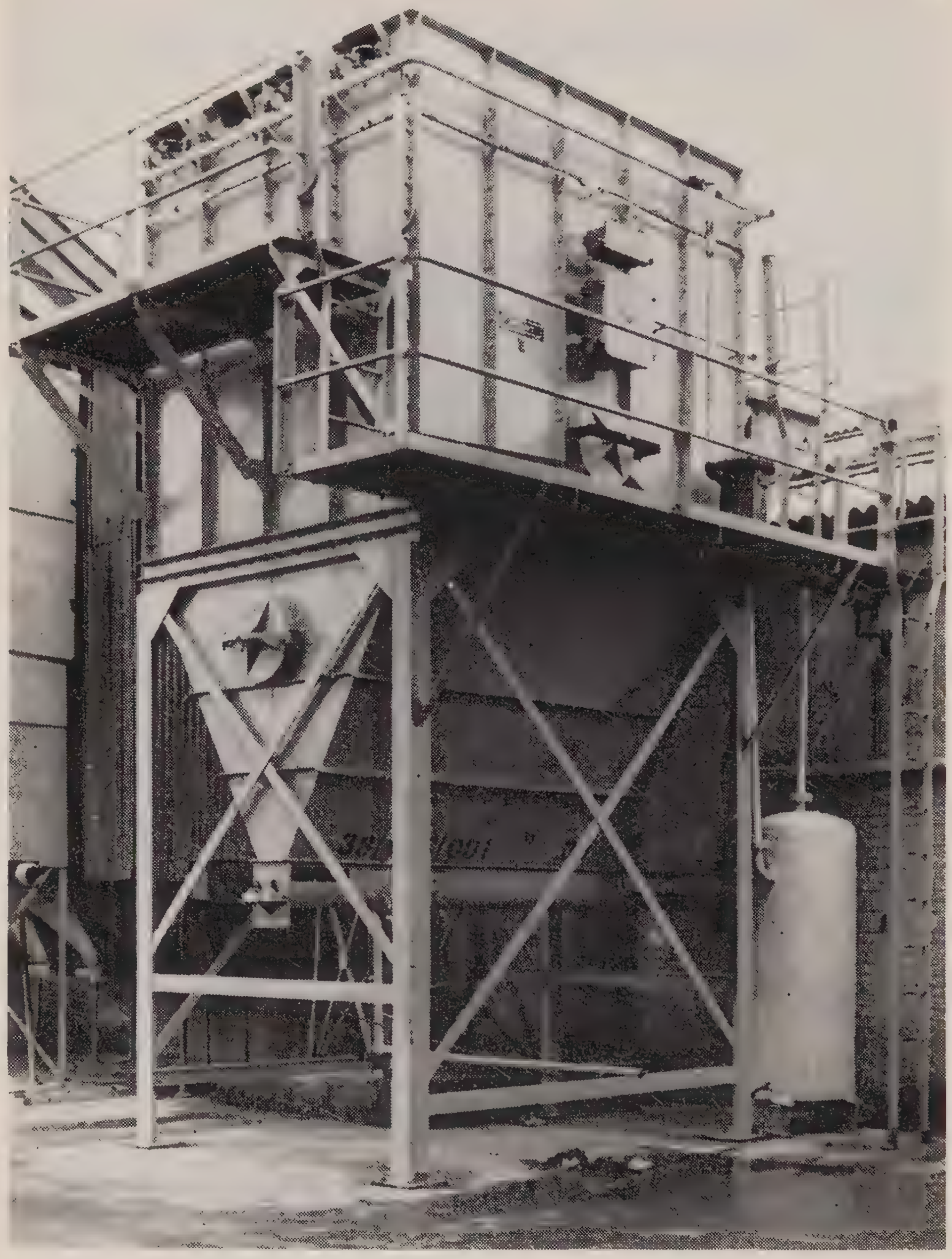

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ENQUIRIES FOR ADVERTISING SPACE

Advertisement Manager, National Society for Clean Air, Field House, Breams Buildings London E.C.4. Te.: 01-242 5038

RATES:

First entry under classified heading, £2; branch addresses 10/- each, extra.

Second and further entries under other headings £1 each and 5/- per branch address

AIR CONDITIONERS (DOMESTIC)

Felvic Industries
21 Foxley Lane, Purley, Croydon CR2 3EH (01-668 2228/9) (*Humidity & Temperature Control*).

M.L. Industrial Products Ltd.
292 Leigh Road Trading Estate, Slough, Bucks. (Slough 26244 & 23838).

AIR CONDITIONING EQUIPMENT

Air Movement Ltd.
76, 76a, 78 Dartford Industrial Estate, Dartford, Kent (Dartford 27571).

Carrier Engineering Co. Ltd.
Carrier House, Warwick Row, London, S.W.1 (01-834 6858) (*Carrier*).

Felvic Industries
21 Foxley Lane, Purley, Croydon, CR2 3EH (01-668 2228/9) (*Humidity & Temperature Control*).

M.L. Industrial Products Ltd.
292 Leigh Road Trading Estate, Slough, Bucks. (Slough 26244 & 23838).

Morgan Air Treatments Ltd.
Darwin Street, Birmingham 12 (021-772 2096 & 1309).

Morgan Air (Scotland) Ltd.
208 Bath Street, Glasgow, C.2 (041 DOV 3611/2/3/4) (*Morganair*).

Norris Warming Co. Ltd.
Burley House, 5-11 Theobalds Road, London, W.C.1 (01-405 7833).
2-3 Melrose Avenue, Clifton, Bristol, BS8 2NE (0272-30261).
Norris House, 611 Stretford Road, Manchester (061-872 3454).
Cross House, Westgate Road, Newcastle, NE1 4XR (0632-611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (0473-57171).

Spencer and Halstead Ltd.
Ossett, Yorkshire (Ossett 5121).
84 High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031).
Spenstead House, Ashley Road, Epsom (Epsom 27101) ("*Spenstead*").

AIR DIFFUSERS

Norris Warming Co. Ltd.
Burley House, 5-11 Theobalds Road, London, W.C.1 (01-405-7833).
2-3 Melrose Avenue, Clifton, Bristol, BS8 2NE (0272-30261).
Norris House, 611 Stretford Road, Manchester M16 ORC (061-872 3454).
Cross House, Westgate Road, Newcastle, NE1 4XR (0632-611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (0473-57171).

AIR POLLUTION MEASUREMENT

BCURA Industrial Laboratories
Randalls Road, Leatherhead, Surrey (Leatherhead 4411).

C. F. Casella & Co. Ltd.
Regent House, Britannia Walk, London, N.1 (01-253 8581) (*Bacteria Sampling Equipment*).

Charles Austen Pumps Ltd.
100 Royston Road, Byfleet, Surrey (Byfleet 43224) (*Pumps*).

Fleming Instruments Ltd.
Caxton Way, Stevenage, Herts. (3101-5) Telex 82385.

Lodge-Cottrell Ltd.
George Street Parade, Birmingham 3 (021-236 3388).
Simon House, 28-29 Dover Street, London, W.1 (01-493 8191) (*Gas Cleaning Plant and services*).

Photoelectronics (Arcall) Ltd.
92 Oldfield Road, Sutton, Surrey (01-644 4571) (*M.O.M.*).

ANTI SOOT AND CORROSION TREATMENT

Polar Industrial Chemicals Ltd.
34 Ebury Street, London, S.W.1 (01-730 7158) (*Panorin*).

AUTOMATIC CONTROL EQUIPMENT

Felvic Industries
21 Foxley Lane, Purley, Croydon, CR2 3EH (01-668 2228/9) (*Humidity & Temperature Control*).

Hoval Boilers (U.K.) Ltd.
Northway House, High Road, Whetstone, London, N.20 (01-445 0454/0092).
Works: Hoval Farrar Boilers Ltd.
Newark-On-Trent, Notts. (*Hoval/Biral.*)

Photoelectronics (Arcall) Ltd.
92 Oldfield Road, Sutton, Surrey (01-644 4571) (*M.O.M.*).

BOILERS, DOMESTIC

Hoval Boilers (U.K.) Ltd.
Northway House, High Road, Whetstone, London, N.20 (01-445 0454/0092).
Works: Hoval Farrar Boilers Ltd.
Newark-on-Trent, Notts. (*Hoval/Biral*).

International Combustion Ltd.
Sinfin Lane, Derby, DE2 9GJ (*Syntron, Sempar, Certuss, Nihot*).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234) (*Parkray, Heatmaster*).

Riley (I.C.) Products Ltd.
19 Woburn Place, London, W.C.1 (Terminus 2833).

BOILERS, INDUSTRIAL

Babcock & Wilcox (Operations) Ltd.
Babcock House, 209 Euston Road, N.W.1 (01-387 4321).
Rutland House, 148 Edmund Street, Birmingham 3 (021-236 6131).
Aylward House, Wine Street, Bristol 1 (0272-294561).
54 West Nile Street, Glasgow, C.1 (041-221 9932).
Peter House, Oxford Street, Manchester 1 (061-236 8326).
Stonebow House, The Stonebow, York (0904-58645).

Edwin Danks & Co. (Oldbury) Ltd.
P.O. Box 4, Oldbury, Warley, Worcs. (021-552 2531).

Hamworthy Engineering Ltd.
Fleets Corner, Poole, Dorset (Poole 5123) (*Burners and Boilers*).

Hoval Boilers (U.K.) Ltd.
Northway House, High Road, Whetstone, London, N.20 (01-445 0454/0092).
Works: Hoval Farrar Boilers Ltd.
Newark-on-Trent, Notts. (*Hoval/Biral*).

International Combustion Ltd.
Sinfin Lane, Derby, DE2 9GJ (*Syntron, Sempar, Certuss, Nihot*).

Riley (I.C.) Products Ltd.
19 Woburn Place, London, W.C.1 (Terminus 2833).

BOILERS, INDUSTRIAL (SOLID FUEL)

Edwin Danks & Co. (Oldbury) Ltd.
P.O. Box 4, Oldbury, Warley, Worcs. (021-552 2531) (*Fuel Oil Storage Tanks*).

BOILERS, INDUSTRIAL (WASTE-FIRED)

Edwin Danks & Co. (Oldbury) Ltd.
P.O. Box 4, Oldbury, Warley, Worcs. (021-552 2531).

International Combustion Ltd.
Sinfin Lane, Derby, DE2 9DJ (*Syntron, Sempar, Certuss, Nihot.*).

G. F. Rider (Process Plant), Ltd.
Leeds Place Works, Tollington Park, London, N.4 (01-272 0404/5/6).

Riley (I.C.) Products Ltd.
19 Woburn Place, London, W.C.1 (01-837 2833)

BOILERS, PACKAGED (OIL-FIRED)

Auto Combustions (London) Ltd.
360-364 Wandsworth Road, London, S.W.8 (01-622 9121) (*Swirlamiser and Autoflame Oil burners*).

Hamworthy Engineering Ltd.
Fleets Corner, Poole, Dorset (Poole 5123) (*Burners and Boilers*).

BURNERS, GAS

Auto Combustions (London) Ltd.
360-364 Wandsworth Road, London, S.W.8 (01-622 9121) (*Swirlamiser and Autoflame Oil Burners*).

Babcock & Wilcox (Operations) Ltd.
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Rutland House, 148 Edmund Street, Birmingham 3 (021-236 6131).
Aylward House, Wine Street, Bristol 1 (0272-29 4561).
54 West Nile Street, Glasgow, C.1 (041-221 9932).
Peter House, Oxford Street, Manchester 1 (061-236 8326).
Stonebow House, The Stonebow, York (0904-58645).

Hamworthy Engineering Ltd.
Fleets Corner, Poole, Dorset (Poole 5123) (*Burners and Boilers*).

International Combustion Ltd.
Sinfin Lane, Derby, DE2 9GJ (*Syntron, Sempar, Certuss, Nihot*).

Nu-Way Eclipse Ltd.
P.O. Box 14, Droitwich, Worcs. (Droitwich 3733).

Nu-Way Heating Plants Ltd.
P.O. Box 1, Droitwich, Worcs. (Droitwich 2331).

Peabody Ltd.
35 Clapham Park Road, London, S.W.4 (01-622 4311/7).

Riley (I.C.) Products Ltd.
19 Woburn Place, London, W.C.1 (Terminus 2833).

BURNERS, OIL

Auto Combustions (London) Ltd.
360-364 Wandsworth Road, London, S.W.8 (01-622 9121) (*Swirlamiser and Autoflame Oil Burners*).

Babcock & Wilcox (Operations) Ltd.
Babcock House, 209 Euston Road, London, N.W.1 (01-387 4321).
Rutland House, 148 Edmund Street, Birmingham 3 (021-236 6131).
Aylward House, Wine Street, Bristol 1 (0272-29 4561).
54 West Nile Street, Glasgow, C.1 (041-221 9932).
Peter House, Oxford Street, Manchester 1 (061-236 8326).
Stonebow House, The Stonebow, York (0904-58645).

Edwin Danks & Co. (Oldbury) Ltd.
P.O. Box 4, Oldbury, Warley, Worcs. (Tel No. 021-552 2531) (*Fuel Oil Storage Tanks*).

Hamworthy Engineering Ltd.
Fleets Corner, Poole, Dorset (Poole 5123) (*Burners and Boilers*).

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P.O. Box I, Droitwich, Worcs. (Droitwich 2331).

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Babcock House, 209 Euston Road, London, N.W.1 (01-387 4321).
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Aylward House, Wine Street, Bristol 1 (0272-29 4561).
54 West Nile Street, Glasgow, C.1 (041-221 9931).
Peter House, Oxford Street, Manchester 1 (061-236 8326).
Stonebow House, The Stonebow, York (0904-58645).

International Combustion Ltd.
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Riley (I.C.) Products Ltd.
19 Woburn Place, London, W.C.1 (Terminus 2833).

CEILINGS, HEATED

Norris Warming Co. Ltd.
Burley House, 5-11 Theobalds Road, London, W.C.1 (01-405 7833).
2-3 Melrose Avenue, Clifton, Bristol, BS8 2NE (0272-30261).
Norris House, 611 Stretford Road, Manchester M16 0RL (061-872 3454).
Cross House, Westgate Road, Newcastle NE1 4XR (0632 611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (0473-57171).

CENTRAL HEATING SYSTEMS

Hoval Boilers (U.K.) Ltd.
Northway House, High Road, Whetstone, London, N.20 (01-445 0454/0092).
Works: Hoval Farrar Boilers Ltd.
Newark-on-Trent, Notts. (*Hoval/Biral*).

Norris Warming Co. Ltd.
Burley House, 5-11 Theobalds Road, London, W.C.1 (01-405 7833).
2-3 Melrose Avenue, Clifton, Bristol, BS8 2NE (0272-30261).
Norris House, 611 Stretford Road, Manchester, M16 0RL (061-872 3454).
Cross House, Westgate Road, Newcastle, NE1 4XR (0632-611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (0473-57171).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234) (*Parkray, Heatmaster*).

CHIMNEYS

F. E. Beaumont Ltd.
Rathgar Road, London, S.W.9 (01-274 4066).
Woodlands Road, Mere, Warminster, Wiltshire.

Edwin Danks & Co. (Oldbury) Ltd.
P.O. Box 4, Oldbury, Warley, Worcs. (021-552 2531).

Steel Chimneys Ltd.
New Hall Works, Lower Edge Road, Elland (Elland 2431).

Tipton Tub & Tube Co. Ltd.
Bloomfield Road, Tipton, Staffs. (021-557 1011 & 3418).

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Thermotank Products Division
Hall Thermotank International Ltd., 150 Helen Street, Glasgow, S.W.1 (041-445 2444).
232-242 Vauxhall Bridge Road, London (*Dri-bore chimneys*).

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F. E. Beaumont Ltd.
Rathgar Road, London, S.W.9 (01-274 4066).
Woodlands Road, Mere, Warminster.

Steel Chimneys Ltd.
New Hall Works, Lower Edge Road, Elland (Elland 2431).

CHIMNEY LININGS

McFarlane—Walls Ltd.
53 Queens Road, Kingston Upon Thames, Surrey (01-549 0801). (*Supaflu Chimney Linings*).

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Air Movement Ltd.
76, 76a, 78 Dartford Industrial Estate, Dartford, Kent (Dartford 27571).

Constant Air Systems Ltd.
Raebarn House, Northolt Road, Harrow, Middlesex, HA2 ODY (01-864 0288).
Devonshire House, High Street, Deritend, Birmingham 12 (021-772 5102/3).

Norris Warming Co. Ltd.
Burley House, 5-11 Theobald Road, London, W.C.1 (01-405 7833).
2-3 Melrose Avenue, Clifton, Bristol, BS8 2NE (0273-30261).

Norris House, 611 Stretford Road, Manchester (061-872-3454).
Cross House, Westgate Road, Newcastle, NE1 4XR (0632-611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (0473-57171).

Phillipson & Co. (Bolton) Ltd.
Holland Street, Astley Bridge, Bolton, Lancs. (Bolton 56511) (*Laminar Flow Bencher*).

COAL HANDLING PLANT

Buell Ltd.
George Street Parade, Birmingham 3 (021-236 5391).
Simon House, 28-29 Dover Street, London, WIX 4NY (01-493 8191).

Edwin Danks & Co. (Oldbury) Ltd.
P.O. Box 4, Oldbury, Warley, Worcs. (021-552 2531).

International Combustion Ltd.
Sinfin Lane, Derby, DE2 9GJ (*Syntron, Sempar, Certuss, Nihot*).

Riley (I.C.) Ltd.
19 Woburn Place, London, W.C.1 (Terminus 2833).

CONTRACTORS, HEATING, VENTILATING & AIR CONDITIONING

Carrier Engineering Company Ltd.
Carrier House, Warwick Row, London, S.W.1 (01-834 6858) (*Carrier*).

Constant Air Systems Ltd.
Raebarn House, Northolt Road, Harrow, Middlesex, HA2 ODY (01-864 0288).
Devonshire House, High Street, Deritend, Birmingham 12 (021-772 5102/3).

Fan Application & Engineering Ltd.
76 Rivington Street, London, E.C.2 (01-739 9329).

Felvic Industries
21 Foxley Lane, Purley, Croydon, CR2 3EH (01-668 2228/9) (*Humidity & Temperature Control*).

Morgan Air Treatments Ltd.
Darwin Street, Birmingham 12 (021-772 2096 & 1309).

Morgan Air (Scotland) Ltd.
208 Bath Street, Glasgow, C.2 (041-DOV 3611/2/3/4) (*Morganair*).

Norris Warming Co. Ltd.
Burley House, 5-11 Theobalds Road, London, W.C.1 (01-405 7833).
2-3 Melrose Avenue, Clifton, Bristol, BS8 2NE (0272-30261).
Norris House, 611 Stretford Road, Manchester (061-872 3454).
Cross House, Westgate Road, Newcastle, NE1 4XR (0632 611071).
Norris House, Hadleigh Road, Ipswich, Suffolk (0473-57171).

CONTROLLED DRAUGHT REGULATORS

Metro-Flex Group of Companies
Metro-Flex Works, Earl Road, London, S.E.1 (01-237 8241) (*Metro-Flex*).

CONVECTORS

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234) (*Parkray, Heatmaster*).

COOLERS

Buell Ltd.
George Street Parade, Birmingham 3 (021 236 5391).
Simon House, 28-29 Dover Street, London, WIX 4NY (01-493 8191).

Felvic Industries
21 Foxley Lane, Purley, Croydon, CR2 3EH (01-668 2228/9) (*Humidity & Temperature Control*).

Peabody Ltd.
35 Clapham Park Road, London, S.W.4 (01-622 4311/7).

DEHUMIDIFIERS

Felvic Industries
21 Foxley Lane, Purley, Croydon, CR2 3EH (01-668 2228/9) (*Humidity & Temperature Control*).

Heather Filters Ltd.
Rosemount Tower, Wallington, Surrey (01-647 2071).

DISCHARGE VALVES

Buell Ltd.
George Street Parade, Birmingham 3 (021-236 5391).
Simon House, 28-29 Dover Street, London, WIX 4NY (01-493 8191).

Joy Manufacturing (U.K.) Ltd.
Western Precipitation Division, Capitol House, Church Street, Epsom, Surrey (Epsom 27661).

Lodge-Cottrell Ltd.
George Street Parade, Birmingham 3 (021-236 3388).
Simon House, 28-29 Dover Street, London, W.1 (01-493 8191) (*Gas Cleaning Plant and Services*).

Nailsea Engineering Co. Ltd.
Samlesbury, Airfield, Blackburn, Lancs. (Mellor 2166).
13 Eastheath Avenue, Wokingham, Berks. (West Forest 4034) (*Pnu-Jet Dust Filters and Collectors*).

DUCTING

Henderson Safety Tank Co. Ltd.
Imperial Way, Purley Way, Croydon, CR9 4LY, Surrey (01-688 7777) (*Ducting*)

Jo-For Engineering (Sheet Metal Works) Ltd.,
76, 76a, 78 Dartford Industrial Estate, Powder Mill Lane, Dartford, Kent (Dartford 27571).

Morgan Air Treatments Ltd.
Darwin Street, Birmingham 12 (021-772 2096 and 1309).

Morgan Air (Scotland) Ltd.
208 Bath Street, Glasgow, C.2 (041-DOV 3611/2/3/4) (*Morganair*).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234) (*Parkray, Heatmaster*).

Tipton Tub & Tube Co. Ltd.
Bloomfield Road, Tipton, Staffs. (021-557 1011 and 3418).

Wright & Summerhill Ltd.
Lupton Street, Leeds 10 (75434-5). (*Constructional Engineers, Sheet Metal, Ventilating & Light*).

DUST CLASSIFICATION PLANT

Bel Sound Products Co.
21 Greenfield, Ryde Estate, Hatfield, Herts. (Hatfield 62915) (*Crystalair*).

Buell Ltd.
George Street Parade, Birmingham 3 (021-236 5391).
Simon House, 28-29 Dover Street, London, W1X 4NY (01-493 8191).

Lodge-Cottrell Ltd.
George Street Parade, Birmingham 3 (021-236 3388).
Simon House, 28-29 Dover Street, London, W.1 (01-493 8191).
(*Gas Cleaning Plant and Services*)

DUST COLLECTION EQUIPMENT & PLANT

Airmaster Engineering Ltd.
Olympia Works, Roundhay Road, Leeds LS8 4BH (Leeds 656494).

August's Ltd.
Exmoor Street, Halifax, Yorkshire (Halifax 61245-9. Telex 51642) (*August National Hydro Filter*).

Buell Limited
George Street Parade, Birmingham 3 (021- 236 5391).
Simon House, 28-29 Dover Street, London, W1X 4NY (01-493 8191).

Bury & Masco Industries Ltd.
Hudcar Lane, Bury, Lancs. (061-764 2262) (*Webron*).

BVC Engineering Ltd.
Leatherhead, Surrey (Ashtead 6121),

Centri-Spray Ltd.
Green Dragon House, 64/70 High Street, Croydon, Surrey (01-688 7431).

Centri-Spray GmbH.
Lloyd Haus, Neue Weyerstrasse, Koln 5, West Germany (23 59 28).

Chemical Construction (G.B.) Ltd.
Regal House, Twickenham, Middlesex (01-892 4455) (*P.A. & W.A. Venturi Scrubbers*).

Constant Air Systems Ltd.
Raebarn House, Northolt Road, Harrow, Middlesex, HA2 ODY (01-864 0288).
Devonshire House, High Street, Deritend, Birmingham, 12 (021-772 5102/3).

Drummond Dust & Fume Extractors Ltd.
Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (01-527 4441/2).

Dust Control Equipment Ltd.
Thurmaston, Leicester LE4 8HP (Syston 0537-23 3333).

Fan Application & Engineering Ltd.
76 Rivington Street, London, E.C.2 (01-739 9329).

Harvey Fabrication Ltd.
Woolwich Road, London, S.E.7 (01-858 3232) (*Harvey, Torit*).

W. C. Holmes & Co. Ltd.
Turnbridge, Huddersfield HD1 6RB (Huddersfield 31651).
16 St. James's Street, London S.W.1 (01-839 6843).

Jo-For Engineering (Sheet Metal Works) Ltd.
Head Office & Works, Units 76, 76a, 78 Dartford Industrial Estate, Powder Mill Lane, Dartford, Kent (Dartford 27571).

Joy Manufacturing (U.K.) Ltd.
Western Precipitation Division, Capitol House, Church Street, Epsom, Surrey (Epsom 27661).

Lodge-Cottrell Ltd.
George Street, Parade, Birmingham 3 (021-236 3388).
Simon House, 28-29 Dover Street, London, W.1 (01-493 8191) (*Gas Cleaning Plant and Services*).

Mikropul Ltd.
Towerfield Industrial Estate, Shoeburyness, Essex (Shoeburyness 2373) (*Mikro*).

Morgan Air Treaments Ltd.
Darwin Street, Birmingham 12 (021-772 2096 & 1309).

Morgan Air (Scotland) Ltd.
208 Bath Street, Glasgow C.2 (041-DOV 3611/2/3/4) (*Morganair*).

Nailsea Engineering Co. Ltd.
Samlesbury Airfield, Blackburn Lancs. (Mellor 2166).
13 Eastheath Avenue, Wokingham, Berks. (West Forest 4034) (*Pnu-Jet dust filters and collectors*).

Newell Dunford Engineering Ltd.
143 Maple Road, Surbiton, Surrey (01-546 7799) (*Airmix, Tubix, Thermix*).

Peabody Ltd.
35 Clapham Park Road, London, S.W.4. (01-622 4311-7).

R. J. Richardson & Sons Ltd.
37 Commercial Street, Birmingham 1 (021-643 2281) (P.B.X.).

G. F. Rider (Process Plant) Ltd.
Leeds Place Works, Tollington Park, London N.4 (01 272 0404/5/6).

Spencer & Halstead Ltd.
Ossett, Yorkshire (Ossett 5121).
84 High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031).
Spenstead House, Ashley Road, Epsom (Epsom 27101) ("*Spenstead*".)

Tilghman Wheelabrator Ltd.
Broadheath, Altrincham, Cheshire (061-928 4242).

DUST SAMPLING EQUIPMENT

Airflow Developments Ltd.
Lancaster Road, High Wycombe, Bucks. (0494-25252).

Bel Sound Products Co.
21 Greenfield, Ryde Estate, Hatfield, Herts. (Hatfield 62915) (*Crystalair*).

C. F. Casella & Co. Ltd.
Regent House, Britannia Walk, London, N.1 (01-253 8581) (*Bacteria Sampling Equipment*).

Fleming Instruments Ltd.
Caxton Way, Stevenage, Herts.
(3101-5). Telex 82385.

Joy Manufacturing (U.K.) Ltd.
Western Precipitation Division, Capitol House, Church Street, Epsom, Surrey (Epsom 27661).

ECONOMISERS-FUEL

Polar Industrial Chemicals Ltd.
34 Ebury Street, London, S.W.1 (01-730 7158) (*Panorin*).

ELECTRICAL PRECIPITATORS

Bel Sound Products Co.
21 Greenfield, Ryde Estate, Hatfield, Herts. (Hatfield 62915) (*Crystalair*).

Harris Engineering Ltd.
Longfield Road, Tunbridge Wells, Kent (Tunbridge Wells 23401) (Telex 95181).
364 High Road, Leytonstone, E.11 (01-539 7453).
Wellington House, 103-105 Pilgrim Street, Newcastle Upon Tyne, 1 (Newcastle 24401).
19-20 Elmdale Road, Bristol 8 (Bristol 30371).
Norwich Union House, 40 Trinity Street, Hanley, Stoke-on-Trent (Stoke-on-Trent 22031) (*Industrial Space Heating and Air Filtration Equipment*).

Head Wrightson Process Engineering Ltd.
G.P.O. Box 10, Teesdale Works, Thornaby-on-Tees, Teesside (0642-62241).

W. C. Holmes & Co. Ltd.
Turnbridge, Huddersfield HD1 6RB (Huddersfield 31651).
16 St. James's Street, London, S.W.1 (01-839 6843).

Joy Manufacturing (U.K.) Ltd.
Western Precipitation Division, Capitol House, Church Street, Epsom, Surrey (Epsom 27661).

Lodge-Cottrell Ltd.
George Street Parade, Birmingham 3 (021-236 3388).
Simon House, 28-29 Dover Street, London, W.1 (01-493 8191) (*Gas Cleaning Plant & Services*).

Tilghman Wheelabrator Ltd.
Broadheath, Altrincham, Cheshire (061-928 4242) (*Air Pollution Control Engineers*).

ELECTRIC VEHICLES

Electric Vehicle Association of Great Britain
Trafalgar Buildings, 1 Charing Cross, London, S.W.1 (01-930 6757) (*On road & Off road Electric Vehicles*).

FANS

Airflow Developments Ltd.
Lancaster Road, High Wycombe, Bucks. (0494-25252).

Edgar Allen Aerex Ltd.
P.O. Box 46, Imperial Steel Works, Sheffield S9 1QZ (Sheffield 49054).

Spencer & Halstead Ltd.
Ossett, Yorkshire (Ossett 5121).
84 High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031).
Spenstead House, Ashley Road, Epsom (Epsom 27101) ("*Spenstead*").

FILTERS, AIR

Bel Sound Products Co.
21 Greenfield, Ryde Estate, Hatfield, Herts. (Hatfield 62915) (*Crystalair*).

Birfield Filtration Ltd.
A G.K.N. Company, 44 Bradford Street, Birmingham 5 (021-643 7961) (*Air Filters*).

Bondina Industrial Ltd.
Greetland, Halifax, Yorks. (Elland 3528) (*Bondina Rollabond*).

Bury & Masco Industries Ltd.
Hudcar Lane, Bury, Lancs. (Bury 2262) (*Webron*).

Declon Foam Plastics Ltd.
Cranbourne Estate, Cranbourne Road, Potters Bar, Hertfordshire (Potters Bar 57151) (*Air Filter Media*).

Harris Engineering Ltd.
Longfield Road, Tunbridge Wells, Kent (Tunbridge Wells 23401) (Telex 95181).
364 High Road, Leytonstone, E.11 (01-539 7453).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne 1. (Newcastle 24401).
19-20 Elmdale Road, Bristol 8 (Bristol 30371).
Norwich Union House, 40 Trinity Street, Hanley, Stoke-on-Trent (Stoke-on-Trent 22031) (*Industrial Space Heating and Air Filtration Equipment*).

Heather Filters Ltd.
Rosemount Tower, Wallington, Surrey (01-647 2071).

Lodge-Cottrell Ltd.
George Street Parade, Birmingham 3 (021-236 3388).
Simon House, 28-29 Dover Street, London, W.1 (01-493 8191) (*Gas Cleaning Plant & Services*).

Nailsea Engineering Co. Ltd.
Samlesbury Airfield, Blackburn, Lancs. (Mellor 2166).
13 Eastheath Avenue, Wokingham, Berks. (West Forest 4034) (*Pnu-Jet dust filters and collectors*).

Spencer & Halstead Ltd.
Ossett, Yorkshire (Ossett 5121)
84 High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031)
Spenstead House, Ashley Road, Epsom. (Epsom 27101). ("*Spenstead*").

Tilghman Wheelabrator Ltd.
Broadheath, Altrincham, Cheshire (061-928 4242) (*Air Pollution Control Engineers*).

Vokes Ltd.
Henley Park, Guildford, Surrey (Guildford 62861).
Salus Street, Burnley, Lancs. (*Air Filters and Air Filter Media*).

FILTERS, AIR MEDIA

Declon Foam Plastics Ltd.
Cranborne Estate, Cranborne Road, Potters Bar, Herts. (Potters Bar 57151).

FILTER PAPER

Evans, Aldard & Co. Ltd.
Postlip Mills, Winchcombe, Cheltenham, Glos. GL 54 588 (024-260 227) (*Postlip Filter Paper*).

FIRE LIGHTERS (ELECTRIC)

Best Products Ltd.
Ranelagh House, Felixstowe, Suffolk (OFX 42-3154/7) ("*Matchless*" *Fire-lighters*).

FLUE ASH & CLINKER CONVEYING PLANT

B.V.C. Engineering Ltd.
Leatherhead, Surrey (Ashtead 6121).

International Combustion Ltd.
Sinfin Lane, Derby DE2 9GJ (*Syntron, Sempar, Certuss, Nihot*).

Riley (I.C.) Products Ltd.
19 Woburn Place, London, W.C.1 (Terminus 2833).

FLUE DUST EXTRACTION PLANT

Buell Ltd.
George Street Parade, Birmingham 3 (021-236 5391).
Simon House, 28-29 Dover Street, London, W1X 4NY (01-493 8191).

Bury & Masco Industries Ltd.
Hudcar Lane, Bury, Lancs. (Bury 2262) (*Webron*).

B.V.C. Engineering Ltd.
Leatherhead, Surrey (Ashtead 6121).

Head Wrightson Process Engineering Ltd.
G.P.O. Box 10, Teesdale Works, Thornaby-on-Tees, Teesside (0642 62241).

W. C. Holmes & Co. Ltd.
Turnbridge, Huddersfield, HD1 6RB (Huddersfield 31651).
16 St. James' Street, London, S.W.1 (01-839 6843).

Joy Manufacturing (U.K.) Ltd.
Western Precipitation Division, Capitol House, Church Street, Epsom, Surrey (Epsom 27661).

Lodge-Cottrell Ltd.
George Street Parade, Birmingham 3 (021-236 3388).
Simon House, 28-29 Dover Street, London, W.1. (01-493 8191) (*Gas Cleaning Plant & Services*).

FLUE GAS DUST MONITORING DEVICE (C.E.G.B. TYPE)

Airflow Developments Ltd.
Lancaster Road, High Wycombe, Bucks. (0494-25252).

Photoelectronics (Arcall) Ltd.
92 Oldfield Road, Sutton, Surrey (01-644 4571) (*M.O.M.*).

FLUE GAS DUST SAMPLING EQUIPMENT (B.C.U.R.A. TYPE)

Airflow Developments Ltd.
Lancaster Road, High Wycombe, Bucks. (0494-25252).

Bury & Masco Industries Ltd.
Hudcar Lane, Bury, Lancs. (Bury 2262) (*Webron*).

FLUE GAS TREATMENT

Chemical Construction (G.B.) Ltd.
Regal House, Twickenham, Middx (01-892 4455) (*P.A. & W.A. Venturi Scrubbers*).

D.C.P. Systems Ltd.
Centre Heights, 137 Finchley Road, London, N.W.3 (01-586 1121).

W. C. Holmes & Co. Ltd.
Turnbridge, Huddersfield HD1 6RB. (Huddersfield 31651).
16 St. James's Street, London, W.1 (01-839 6843).

Lodge-Cottrell Ltd.
George Street Parade, Birmingham 3 (021-236 3388).
Simon House, 28-29 Dover Street, London, W.1. (01-493 8191) (*Gas Cleaning Plant and Services*).

Marshall & Parsons Ltd.
1111 London Road, Leigh-on-Sea, Essex (0702-74867) (*Draught Master*).

Peabody Ltd.
35 Clapham Park Road, London, S.W.4 (01-622 4311/7)

Polar Industrial Chemicals Ltd.
34 Ebury Street, London, S.W.1 (01-730 7158) (*Panorin*).

FUEL EFFICIENCY ADVISORY SERVICE

National Industrial Fuel Efficiency Service
Abford House, 15 Wilton Road, London, S.W.1 (01-828 8241).

FUEL-ELECTRICITY SUPPLY

The Electricity Council
30 Millbank, London, S.W.1. 01-834 2333).
Marketing Dept:
Trafalgar Buildings, 1 Charing Cross, London, S.W.1. (01-930 6757).

FUEL—GAS

The Gas Council
59 Bryanston Street, Marble Arch, London, W.1A 2AZ (01-723 7030).

FUEL—GAS (L.P.G.)

Shell-Mex and B.P. Gases Ltd.
Shell-Mex House, Strand, London, W.C.2. (01-836 1234) (*Bottogas, Butane, Propagas, Propane*).

FUELS (SOLID SMOKELESS)

National Carbonising Company Ltd.
Fullarton Lodge, Crow Hill Drive, Mansfield, Notts. (Mansfield 22357)
Thorney House, 34 Smith Square, Westminster, London, S.W.1. (01-222 7331). (*Rexco*).

National Coal Board,
Hobart House, Grosvenor Place, London, S.W.1 (01-235 2020).
Coal Products Division: Coal House, Lyon Road, Harrow, Middx. (01-427 9001) (*Homefire, Multiheat, Phurnacite, Roomheat, Sunbrite, Anthracite, Welsh Dry, Steam*).

FUEL OIL (DOMESTIC & INDUSTRIAL OIL FUELS)

Shell-Mex & B.P. Ltd.
Shell-Mex House, Strand, London, W.C.2 (01-836 1234).

FUEL OIL COMBUSTION IMPROVER

A. G. Field & Co. Ltd.
18 City Road, London, E.C.1 (01-638 9331) (Telex 2-8705) (Cables: Andairon London) (*Rolfite*).

FUEL OIL CONDITIONER

A. G. Field & Co. Ltd.
18 City Road, London, E.C.1 (01-638 9331) (Telex 2-8705) (Cables: Andairon London) (*Rolfite*).

FUEL OIL STORAGE TANKS (REINFORCED CONCRETE)

Edwin Danks & Co. (Oldbury) Ltd.
P.O. Box 4, Oldbury, Warley, Worcs. (021-552 2531).

FUME REMOVAL EQUIPMENT

Buell Ltd.
George Street Parade, Birmingham 3 (021-236 5391).
Simon House, 28-29 Dover Street, London, W1X 4NY (01-493 8191).

Bury & Masco Industries Ltd.
Hudcar Lane, Bury, Lancs. (061-764 2262) (*Webron*).

Centri-Spray Ltd.
Green Dragon House, 64-70 High Street, Croydon, Surrey (01-688 7431).

Centri-Spray GmbH
Lloyd Haus, Neue Weyerstrasse, Koln 5, West Germany (23 59 28)

Chemical Construction (G.B.) Ltd.
Regal House, Twickenham, Middlesex (01-892 4455) (*P.A. & W.A. Venturi Scrubbers*).

Constant Air Systems Ltd.
Raebarn House, Northolt Road, Harrow, Middlesex HA2 0DY (01-864 0288).
Devonshire House, High Street, Deritend, Birmingham 12 (021-772 5102/3).

Drummond Dust & Fume Extractors Ltd.
Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (01-527 4441/2)

Fan Application & Engineering Ltd.
76 Rivington Street, London, E.C.2 (01-739 9329).

Harvey Fabrication Ltd.
Woolwich Road, London, S.E.7 (01-858 3232) (*Harvey, Torit*).

Head Wrightson Process Engineering Ltd.
G.P.O. Box 10, Teesdale Works, Thornaby-on-Tees, Teesside, England (0642-62241).

W. C. Holmes & Co. Ltd.
Turnbridge, Huddersfield HD1 6RB (Huddersfield 31651).
16 St. James's Street, London, S.W.1 (01-839 6843).

Joy Manufacturing (U.K.) Ltd.
Western Precipitation Division, Capitol House, Church Street, Epsom, Surrey (Epsom 27661).

Lodge-Cottrell Ltd.
George Street Parade, Birmingham 3 (021-236 3388).
Simon House, 28-29 Dover Street, London, W.1 (01-493 8191) (*Gas Cleaning Plant and Services*).

Mikropul Ltd.
Towerfield Industrial Estate, Shoeburyness, Essex (Shoeburyness 2373) (*Mikro*).

Morgan Air Treatments Ltd.
Darwin Street, Birmingham 12 (021-772 2096 & 1309).
Morgan Air (Scotland) Ltd.
208 Bath Street, Glasgow, C2 (041-DOV 3611/2/3/4) (*Morganair*).

Newell Dunford Engineering Ltd.
143 Maple Road, Surbiton, Surrey (01-546 7799) (*Airmix, Tubix, Thermix*).

Peabody Ltd.
35 Clapham Park Road, London, S.W.4 (01-622 4311/7).

R. J. Richardson & Sons Ltd.
37 Commercial Street, Birmingham 1 (021-643 2281) (P.B.X.).

Spencer & Halstead Ltd.
Ossett, Yorkshire (Ossett 5121).
84, High Street, Cradley Heath, Warley, Worcs. (Cradley Heath 67031)
Spenstead House, Ashley Road, Epsom (Epsom 27101). (*Spenstead*).

Tilghman Wheelabrator Ltd.
Broadheath, Altrincham, Cheshire (061-928 4242) (*Air Pollution Control Engineers*).

FURNACES, KILNS, OVENS, ETC.

R. M. Catterson-Smith Ltd.
Adams Bridge Works, South Way, Exhibition Grounds, Wembley (01-902 4291) (*Electric Furnaces*).

International Combustion Ltd.
Sinfin Lane, Derby DE2 9GJ (*Syntron, Sempar, Certuss, Nihot*).

Riley (I.C.) Products Ltd.
19 Woburn Place, London, W.C.1 (Terminus 2833).

FURNACE PRESSURE CONTROLLERS

Metro-Flex Group of Companies
Metro-Flex Works, Earl Road, London, S.E.1 (01-237 8241) (*Metro-Flex*).

GAS CLEANING PLANT

Centri-Spray Ltd.
Green Dragon House, 64-70 High Street, Croydon, Surrey (01-688 7431).

Centri-Spray GmbH
Lloyd Haus, Neue Weyerstrasse, Koln 5, West Germany (23 59 28).

Chemical Construction (G.B.) Ltd.
Regal House, Twickenham, Middx. (01-892 4455) (*P.A. & W.A. Venturi Scrubbers*).

Head Wrightson Process Engineering Ltd.
G.P.O. Box 10, Teesdale Works, Thornaby-on-Tees, Teesside (0642-62241).

W. C. Holmes & Co. Ltd.
Turnbridge, Huddersfield HD1 6RB (Huddersfield 31651).
16 St. James's Street, London, S.W.1 (01-839 6843).

Joy Manufacturing (U.K.) Ltd.
Western Precipitation Division, Capitol House, Church Street, Epsom, Surrey (Epsom 27661).

Lodge-Cottrell Ltd.
George Street Parade, Birmingham 3 (021-236 3388).
Simon House, 28-29 Dover Street, London, W.1 (01-493 8191) (*Gas Cleaning Plant and Services*).

Peabody Ltd.
35 Clapham Park Road, London, S.W.4 (01-622 4311/7).

GAS HEATING EQUIPMENT

Harris Engineering Ltd.
Longfield Road, Tunbridge Wells, Kent (Tunbridge Wells 23401) (Telex 95181).
564 High Road, Leytonstone, E.11 (01-539 7453).

Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne 1 (Newcastle 24401).
19-20 Elmdale Road, Bristol 8 (Bristol 30371).
Norwich Union House, 40 Trinity Street, Hanley, Stoke-on-Trent (Stoke-on-Trent 22031) (*Industrial Space Heating and Air Filtration Equipment*).

GAS SCRUBBERS & WASHERS

Chemical Construction (G.B.) Ltd.
Regal House, Twickenham, Middx. (01-892 4455) (*P.A. & W.A. Venturi Scrubbers*).

Drummond Dust & Fume Extractors Ltd.
Byron Works, Blackhorse Lane, Walthamstow, London, E.17 (01-527 4441/2)

Head Wrightson Process Engineering Ltd.
G.P.O. Box 10, Teesdale Works, Thornaby-on-Tees, Teesside (0642-62241).

W. C. Holmes & Co. Ltd.
Turnbridge, Huddersfield HD1 6RB (Huddersfield 31651).
16 St. James's Street, London, S.W.1 (01-839 6843).

Joy Manufacturing (U.K.) Ltd.
Western Precipitation Division, Capitol House, Church Street, Epsom, Surrey (Epsom 27661).

Lodge-Cottrell Ltd.
George Street Parade, Birmingham 3 (021-236 3388).
Simon House, 28-29 Dover Street, London, W.1 (01-493 8191) (*Gas Cleaning Plant and Services*).

Mikropul Ltd.
Towerfield Industrial Estate, Shoeburyness, Essex (Shoeburyness 2373) (*Mikro*).

Peabody Ltd.
35 Clapham Park Road, London, S.W.4 (01-622 4311/7).

GRIT ARRESTERS

Buell Ltd.
George Street Parade, Birmingham 3 (021-236 5391).
Simon House, 28-29 Dover Street, London, W1X 4NY (01-493 8191).

Fan Application & Engineering Ltd.
76 Rivington Street, London E.C.2 (01-739 9329).

W. C. Holmes & Co. Ltd.
Turnbridge, Huddersfield HD1 6RB (Huddersfield 31651).
16 St. James's Street, London, S.W.1 (01-839 6843).

Joy Manufacturing (U.K.) Ltd.
Western Precipitation Division, Capitol House, Church Street, Epsom Surrey (Epsom 27661).

Lodge-Cottrell Ltd.
George Street Parade, Birmingham 3 (021-236 3388).
Simon House, 28-29 Dover Street, London W.1. (01-493 8191) (*Gas Cleaning Plant and Services*).

Newell Dunford Engineering Ltd.
143 Maple Road, Surbiton, Surrey (01-546 7799) (*Airmix, Tubix, Thermix*).

Tipton Tub & Tube Co. Ltd.
Bloomfield Road, Tipton, Staffs. (021-557 1011 & 3418).

HEAT PUMPS

M.L. Industrial Products Ltd.
292 Leigh Road Trading Estate, Slough, Bucks. (Slough 26244 & 23838).

HEATERS, AIR

Auto Combustions (London) Ltd.
360-364 Wandsworth Road, London, S.W.8 (01-622 9121) (*Swirlamiser, and Autoflame Oil Burners*).

Harris Engineering Ltd.
Longfield Road, Tunbridge Wells, Kent (Tunbridge Wells 23401) (Telex 95181).

564 High Road, Leytonstone, E.11. (01-539 7453)
Wellington House, 103-105 Pilgrim Street, Newcastle-on-Tyne 1 (Newcastle 24401).
19-20 Elmdale Road, Bristol 8 (Bristol 30371).
Norwich Union House, 40 Trinity Street, Hanley, Stoke-on-Trent (Stoke-on-Trent 22031) (*Industrial Space Heating and Air Filtration Equipment*).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234) (*Parkray, Heatmaster*).

HEATERS, WATER

W. H. Dean & Son Ltd.
Accrington Road, Burnley, Lancs. (Burnley 21711) (*Dean Maxol*).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234) (*Parkray, Heatmaster*).

HEATING EQUIPMENT DOMESTIC

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234) (*Parkray, Heatmaster*).

HEATING EQUIPMENT, INDUSTRIAL (PROCESS SPACE)

R. M. Catterson-Smith Ltd.
Adams Bridge Works, South Way, Exhibition Grounds, Wembley (01-902 4291) (*Electric Furnaces*).

Harris Engineering Ltd.
Longfield Road, Tunbridge Wells, Kent (Tunbridge Wells 23401) (Telex 95181).
564 High Road, Leytonstone, E.11 (01-539 7453).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne 1 (Newcastle 24401).
19-20 Elmdale Road, Bristol 8 (Bristol 30371).
Norwich Union House, 40 Trinity Street, Hanley, Stoke-on-Trent (Stoke-on-Trent 22031) (*Industrial Space Heating and Air Filtration Equipment*).

Spencer & Halstead Ltd.
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Norwich Union House, 40 Trinity Street, Hanley, Stoke-on-Trent (Stoke-on-Trent 22031). (*Industrial Space Heating and Air Filtration Equipment*).

Radiation Parkray Ltd.
Radiation House, North Circular Road, London, N.W.10 (01-459 1234). (*Parkray Heatmaster*).

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54 West Nile Street, Glasgow, C.1 (041-221 9932).
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564 High Road, Leytonstone, E.11 (01-539 7453).
Wellington House, 103-105 Pilgrim Street, Newcastle-upon-Tyne 1 (Newcastle 24401).
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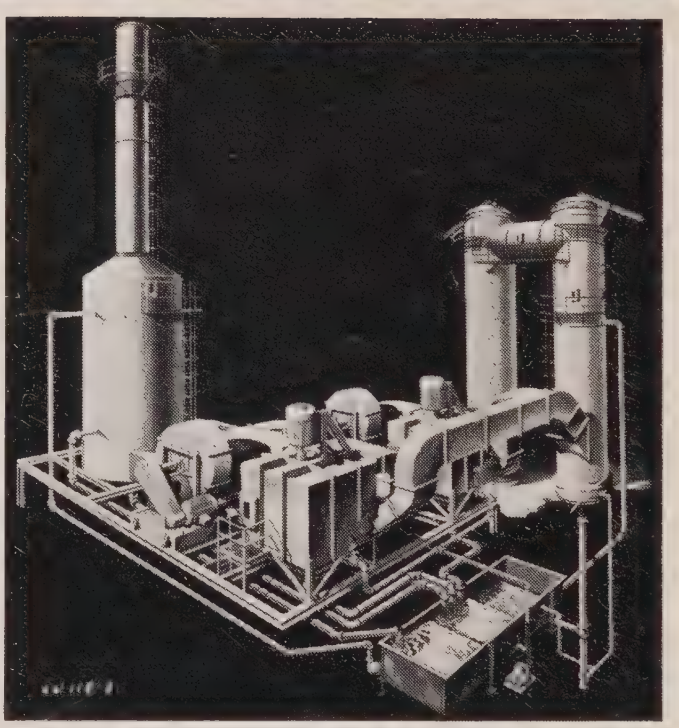

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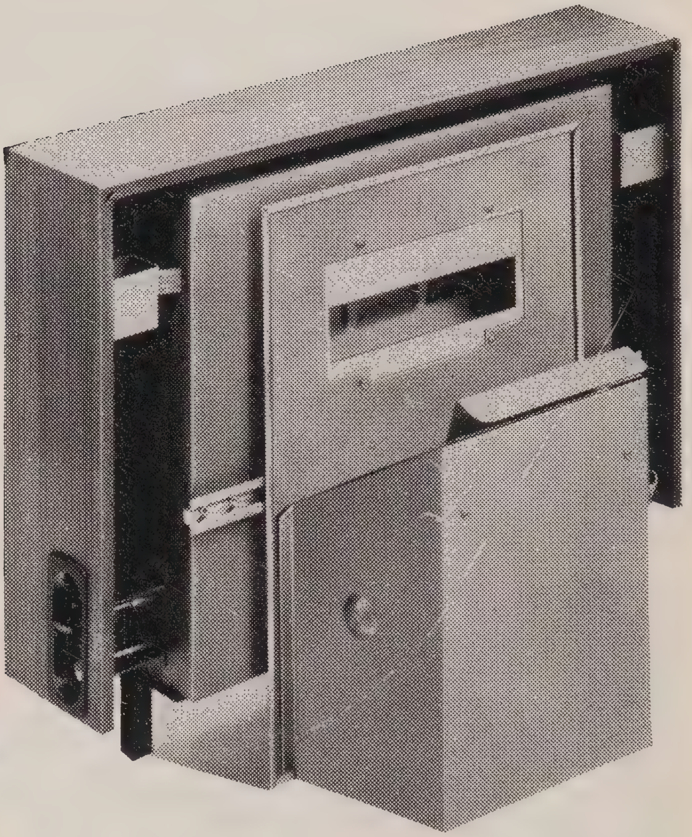

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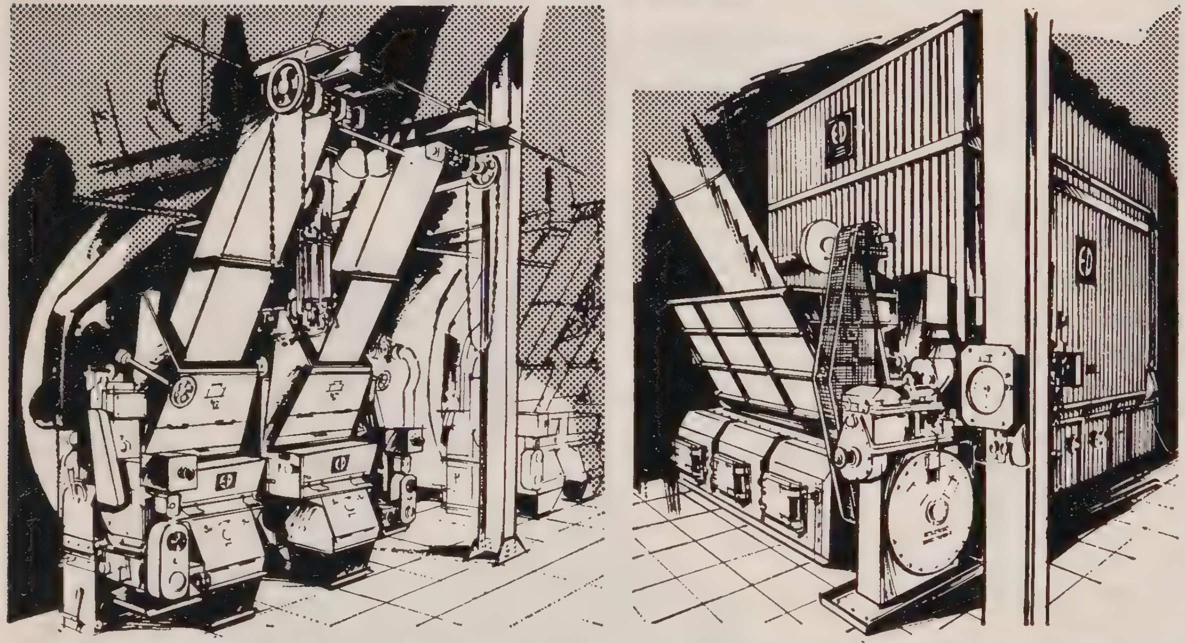

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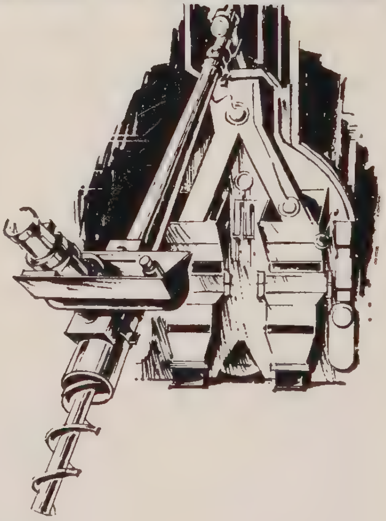

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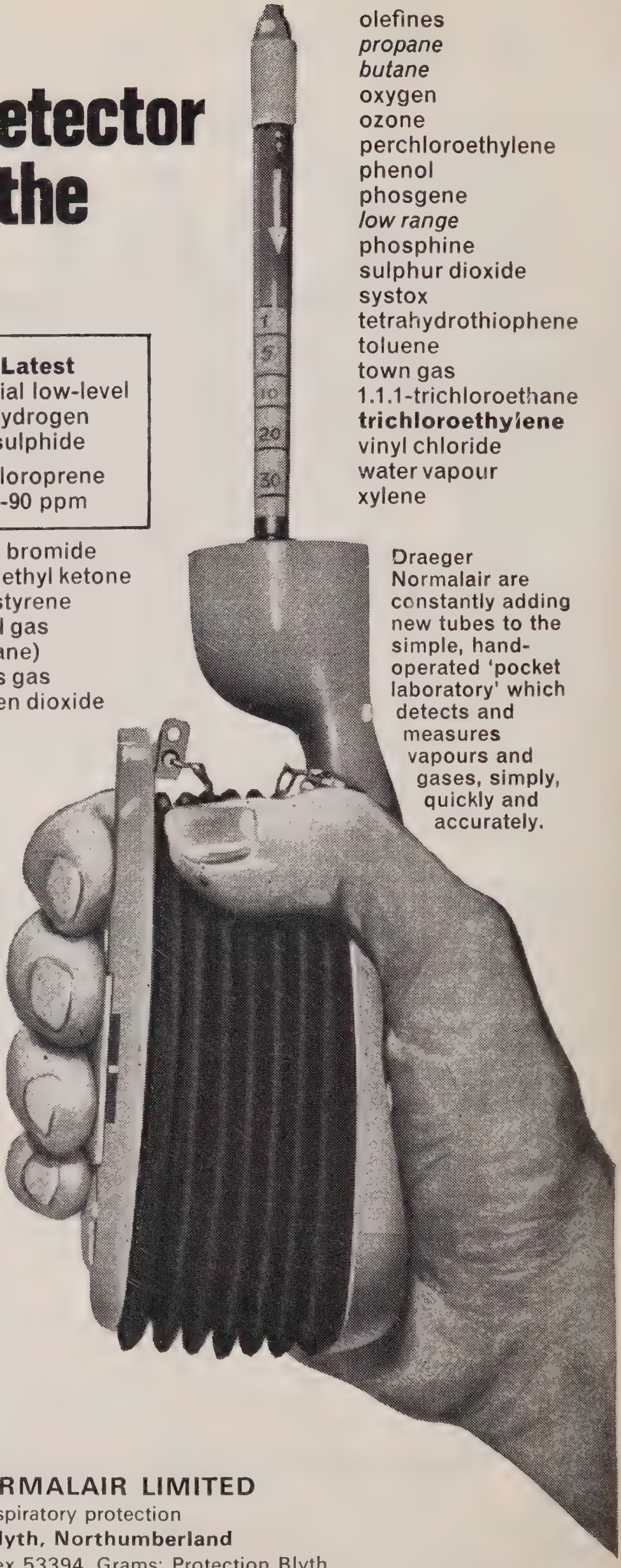

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